Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

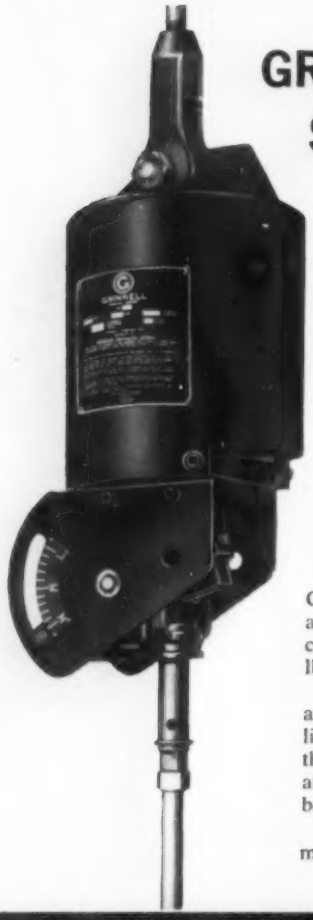
NOVEMBER
1959

IMPROVED INSTRUMENT MAINTENANCE

SEE . . . . . PAGE 28

SPI

GRINNELL CONSTANT SUPPORTS...



2 BASIC DESIGNS...

11 DIFFERENT METHODS OF ATTACHMENT

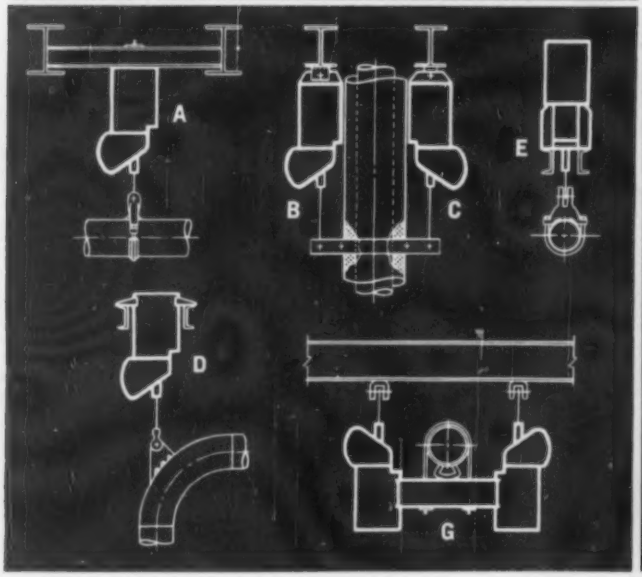
Grinnell Constant Supports are available in a range of sizes to provide capacities for loads from 27 lbs. to 57,500 lbs., with travels up to 16 inches.

Both vertical and horizontal hangers are designed to operate in extremely limited space. In the selection of types, there is a choice of 11 methods of attachment to structures—either above, between, or below supporting steel.

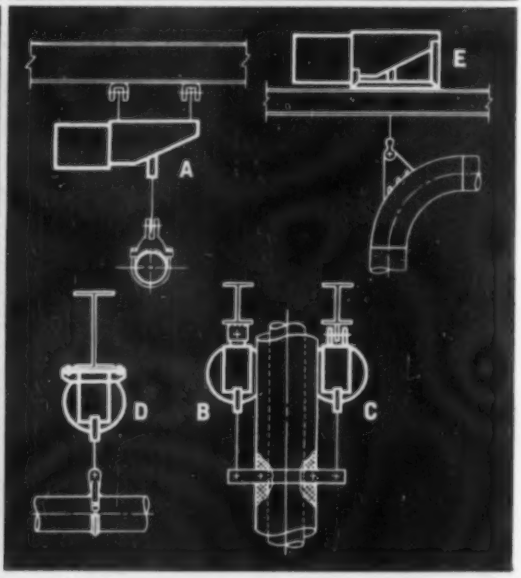
Grinnell Constant Supports provide mathematically perfect load support throughout all positions of travel . . . also a full 70 percentage points of adjustability is built into them. No less than 10% of this adjustability is allowed either side of calibration for plus or minus change in load. Field readjustments are easily made by turning a single load adjustment bolt.

Call on Grinnell's Pipe Suspension Department for help with your pipe suspension problems. Grinnell Company, Providence 1, Rhode Island.

FOR VERTICAL ATTACHMENT



FOR HORIZONTAL ATTACHMENT



GRINNELL

AMERICA'S No. 1 SUPPLIER OF PIPE HANGERS AND SUPPORTS

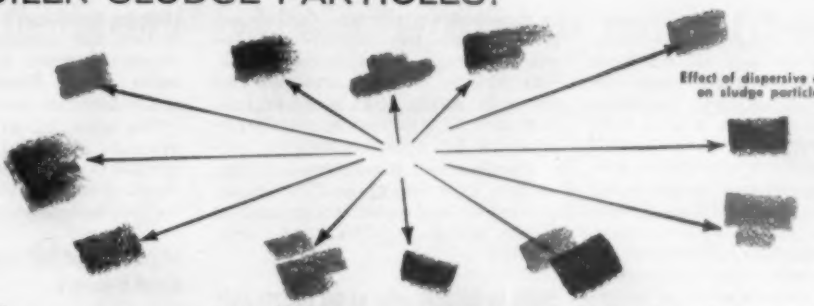
SOUTHERN POWER & INDUSTRY is published monthly by W. R. C. Smi th Publishing Co., Executive and Editorial Offices: 806 Peachtree St., N.E., Atlanta 8, Ga. Second-class postage paid at Charlotte, N. C. Subscription Rates: United States and Possessions, $1.50 per year or two years for $3.00; Foreign Countries, $10.00 per year.

Volume 77 Number 11

ALLIS-CHALMERS

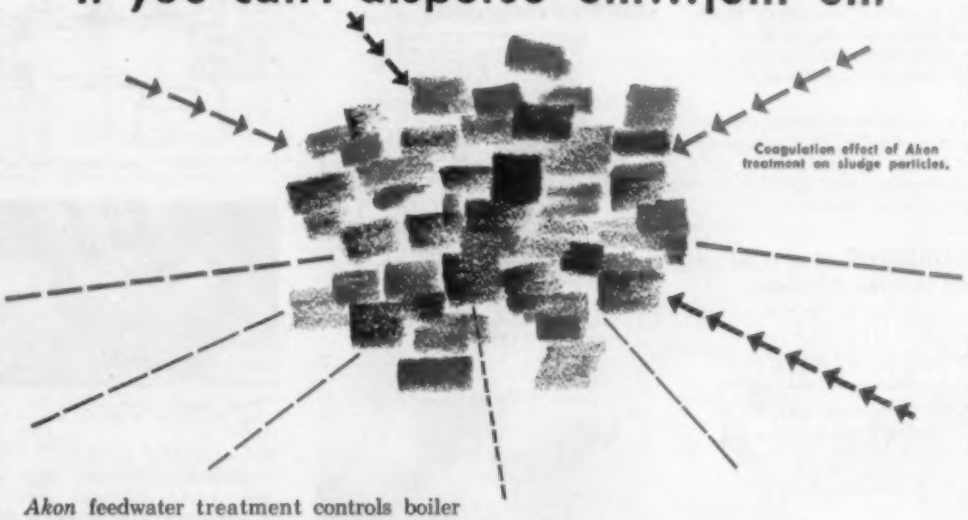
In pace with POWER... ALLIS-CHALMERS

BOILER SLUDGE PARTICLES:



Effect of dispersive agent on sludge particles.

If you can't disperse 'em...join 'em



Coagulation effect of Akon treatment on sludge particles.

Akon feedwater treatment controls boiler sludges where dispersive agents fail or lose their original effectiveness.

Coagulating action of *Akon* treatment takes sludge particles out of circulation by forming fluffy, *nonadherent* flocs. These flocs are readily discharged with less blowdown than otherwise required — save fuel, water and chemicals.

More advantages of this process: Eliminates dissolved oxygen by scavenging action to prevent corrosion; permits operation at lower alkalinities; reduces tendency for carryover with no decomposition products.

To cut your boiler operating costs and protect your equipment investment now and for years to come, specify Allis-Chalmers feedwater treatment.

Akon is an Allis-Chalmers trademark.

Bulletin 2887408 illustrates and describes *Akon* treatment. Bulletin 28X7731 provides correct procedures for boiler cycle blowdown.

Mail coupon below for helpful facts on *Akon* treatment and blowdown —

ALLIS-CHALMERS
Milwaukee 1, Wisconsin
Gentlemen:
Please send me the bulletins I have checked below:
☐ 2887408 on *Akon* treatment
☐ 28X7731 on Blowdown

Name.....
Title.....
Company.....
Address.....
City.....
Zone..... State.....

A-1153

AC ALLIS-CHALMERS
WATER CONDITIONING
✓ EQUIPMENT ✓ CHEMICALS ✓ SERVICE

ALLIS-CHALMERS

TURBO-COMPRESSORS AND BLOWERS

2500 cfm and up

By Eugen P. Eicher, M.E., Brown Boveri Corp.

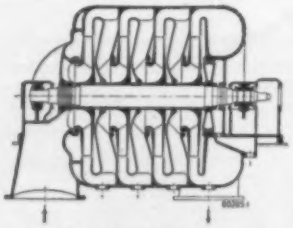
BROWN BOVERI

Brown Boveri offers complete compressor sets including compressor, choice of drives and all auxiliary equipment. Brown Boveri manufactures all the components, assembles and tests the complete sets in their own workshops and assumes full responsibility for the complete unit.

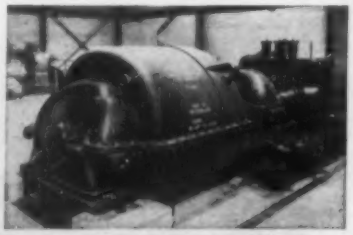
Compressors include a full range of centrifugal and axial types. Drives include steam turbines, gas turbines, expander turbines and electric motors. (Where hot waste gases are available, for example, a combination of motor-generator and exhaust-gas expander turbine drives has reduced power costs 60 to 70%.) Auxiliary equipment includes gear sets, pressure and volume regulators, air and gas coolers and complete electrical control systems.

Brown Boveri compressor sets are used by many leading U. S. companies and are backed by engineering skill, product reliability, and complete U. S. service staff and facilities.

2500 to 175,000 cfm at up to 60 psi* Uncooled centrifugal blowers



Four-stage centrifugal compressor.



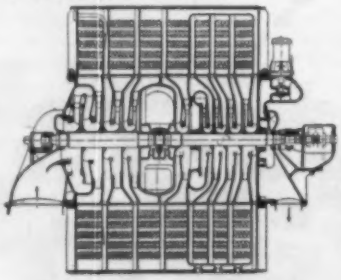
One of two 40,000 cfm centrifugal blowers with steam turbine drive in a copper conversion plant, Arizona.

First developed by Brown Boveri. Advantages over reciprocating compressors in the above ranges: lower cost, higher efficiency, less maintenance, less floor space and *clean, oil-free air.*

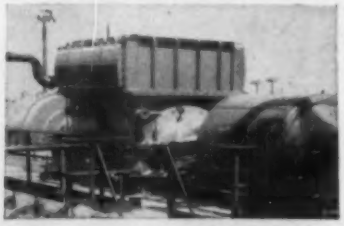
Standard designs are for air or non-poisonous, non-corrosive and non-explosive gases. Stainless steel impellers, shafts, etc. are available for corrosive gases. High-pressure casings and oil type sealing glands are available for higher pressures.

Applications: Blast furnaces, converters, coke ovens, gas distribution, process air and gases, air separation plants, sewage aeration, tunnel ventilation.

5000 to 80,000 cfm at 60 to 120 psi* Internally-cooled "Isotherm" centrifugal compressors



Nine-stage "Isotherm" compressor with anti-surge power-recovery turbine.



"Isotherm" compressor driven by a synchronous motor (left) and a waste-gas recovery turbine (right) at a California chemical plant.

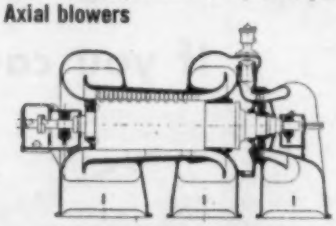
Highest inherent efficiency. Ten basic models with 6 to 9 stages per casing. Impeller diameters from approx. 1 ft. to 4 ft. The larger models include a built-in power-recovery turbine to allow running at loads below the surge limit.

Stainless steel impellers, shafts, etc. are available. For discharge pressures higher than 120 psi, "Isotherm" compressors are followed by an uncooled centrifugal compressor or other booster.

Drives: Four-pole synchronous motors are generally preferred for 1500 hp and larger units, other type motors for smaller sizes. Speed-increasing gears are used with all motor drives. Variable-speed steam or gas turbines are direct coupled.

The reliability of "Isotherm" compressors is proved by hundreds of installations in mines, shipyards, chemical process plants, air liquefying plants, aerodynamics laboratories.

10,000 to 500,000 cfm at up to 80 psi* Axial blowers



Ten-stage axial compressor with anti-surge power recovery turbine.

Axial blower, steam turbine drive, supplying 70,000 cfm of air for a blast furnace.

Substantially more efficient than centrifugal units for large air volumes where adequate pressure can be delivered with a single unit and without cooling. The higher efficiency allows smaller and better drives and lower cost. A power-recovery turbine may be built in to permit operation at volumes below the surge limit.

Drives. Steam turbines allow simple, automatic control through Brown Boveri pressure-oil governors with pressure or volume regulator. Brown Boveri gas turbines and electric motor drives of all types are also available.

Applications: Gas turbines, wind tunnels and chemical plants. In Europe, Brown Boveri axial compressors driven by gas turbines are widely used for blast furnace air with substantial power savings.

**Capacities for single machines. Higher discharge pressures can be obtained by combining various types of equipment in series.*

BROWN BOVERI

U. S. Sales and Engineering: Brown Boveri Corp., Dept. SP-11 19 Rector Street, New York 6, N. Y. Agents in 27 U. S. Cities.

BPA NBP

Southern Power & Industry

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Facts and Trends

November, 1959

◆ ELECTRICAL EQUIPMENT CLEANER — The composition, described in a recent report released to industry through the Office of Technical Services, U. S. Department of Commerce, contains four components — hydrocarbon solvent, surfactant, penetrant, and water. In combination with a water-displacing composition developed earlier by the Navy, it quickly cleans electrical equipment fouled with oil and sea water.

The illustrated report, PB 151670 Salvage of Flooded Electrical Equipment, June 1959, may be ordered from OTS, U. S. Department of Commerce, Washington 25. It contains 21 pages, price 75 cents.

◆ BIG ALUMINUM PIPE — A 16-inch aluminum pipeline, believed to be the largest ever made of the light metal, will be installed for Superior Oil Company in Lake Maracaibo, Venezuela. The 1,800-foot line will be laid in the lake as a suction line for a fire protection pump at Superior's tank farm. The line will have a normal capacity of 2,000 gallons of water per minute.

The system was designed by Pipeline Technologists, Inc., of Houston. Reynolds Metals Company will supply 25,700 pounds of alloy 5083-H113 aluminum for the one-fourth inch wall pipe. The pipe will be fabricated by Graver Tank Corp. It will be rolled and welded from quarter-inch plate. Aluminum was chosen because its corrosion resistance permits installation in the lake without protective coating or wrapping.

◆ BETTER COCOONS — Two cocooned enclosures have been found best by the Army for storage of nearly all types of Quartermaster equipment in climates similar to Richmond, Virginia's. A report of the four-year study of 59 experimental enclosures has just been released for industry use through the Office of Technical Services.

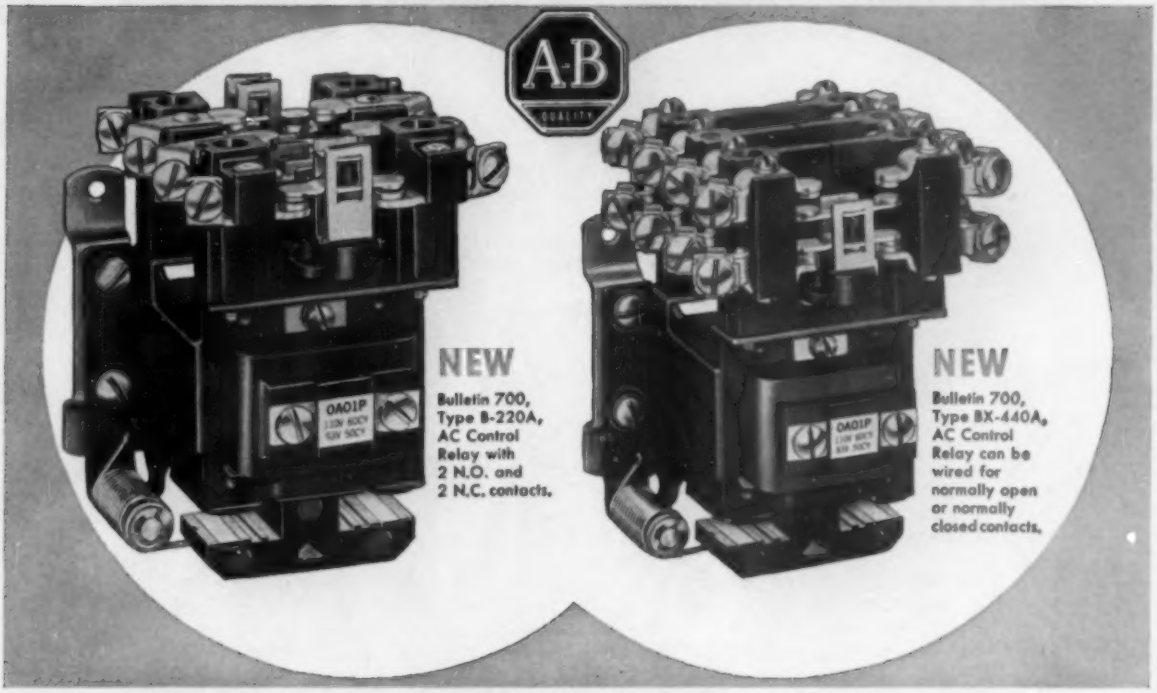
The booklet, 34 pages, designated PB151647, may be ordered from OTS, U. S. Department of Commerce, Washington 25, D. C., price $1.00.

◆ HECTIC EDUCATION — Soviet Premier Khrushchev's boast that Russia is graduating three times as many engineers as the United States should not panic the nation into a renewal of the "numbers game" which was one of the unfortunate repercussions of the launching of Sputnik I, according to Harold A. Mosher, president of National Society of Professional Engineers.

It would be a disservice to our defense efforts to play up numbers at the sacrifice of the much more important emphasis on quality, the professional society leader added. Mosher said that all who have studied the engineering personnel situation carefully are agreed that the primary needs are at the poles of the engineering force—advanced knowledge acquired through graduate study and engineering and scientific technicians to back up and support the professional force by relieving them on the less creative and routine aspects of their work.

(Continued on Page 6)

A New Era
in
Relay Life and Reliability


A-B
QUALITY
NEW
Bulletin 700, Type B-220A, AC Control Relay with 2 N.O. and 2 N.C. contacts.
NEW
Bulletin 700, Type BX-440A, AC Control Relay can be wired for normally open or normally closed contacts.

NEW ALLEN-BRADLEY BULLETIN 700 RELAYS
Improved features set new performance standards

For years, Allen-Bradley Bulletin 700 Type B and Type BX relays have been preferred for their long life and trouble free operation. The improvements in the new Bulletin 700 Type B and Type BX relays will set new performance standards wherever they are used. Naturally they use the famous A-B double break, silver alloy contacts which always remain in perfect operating condition without cleaning or filing. The cast coil cannot be damaged by the severest atmospheric conditions.

These new Allen-Bradley Bulletin 700 Type B and Type BX relays offer even greater value and greater reliability than ever before—but the price has not been changed.

- **New mechanical design gives at least 5 times greater operating life.**
- **New contact motion provides 10 times greater electrical reliability.**
- **Complete interchangeability—mounting dimensions are unchanged.**
- **New hermetically sealed plastic coil fits Bulletin 700 relays presently in use.**
- **New, stronger, movable contact crossbar—also fits old relays.**
- **New reinforced stationary contact blocks—interchangeable with previous design.**

ALLEN-BRADLEY | QUALITY MOTOR CONTROL

Allen-Bradley Co., 1328 S. Second St., Milwaukee 4, Wis. • In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

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TULSA—John W. Elder Co., 1526 East Fourth St., Tel: Diamond 3-9149

Facts and Trends — Continued from Page 4

◆ STACK SPRAY PERFECTED — Blowing soot is a necessary aid to efficient combustion but from the public viewpoint, it is a recurring crisis. The trick has been to maintain a clean boiler without soiling the windowsills, washlines and cars of residents in the vicinity of the plant. Bituminous Coal Research, Inc., recognizing that complaints against soot nuisance were a serious threat to the continuance of coal burning, has developed the solution — the stack spray.

The idea of the stack spray was not new; some haphazard spray installations had been tried before. It was not until BCR spent some time and money to develop a practical design, however, that the idea became an effective device. BCR, in fact, has taken all the guesswork out of spray installations through its bulletin, BCR Aid to Industry 500-330, which explains the location of the spray, correct nozzle size and pipe diameter, proper water pressure and other details. These instructions have not only simplified installation; if followed closely, they produce phenomenal results. Write Bituminous Coal Institute, Southern Building, Washington 5, D. C.

◆ PATENTS & INVENTIONS — New Patent Office booklet tells how to promote and protect inventions. Write Supt. of Documents, Washington 25, D. C. Price, 15¢.

◆ SMALLER INSTRUMENT SYSTEMS — Circuit simplification has resulted in smaller instrument systems for recording the performance of steam turbines, it was reported at the fall general meeting of the American Institute of Electrical Engineers.

In a typical installation, seven vacuum tubes were used compared with 22 in a previous system. The panel space required is only six feet square, or about one-third of the area of the older instrumentation. Paper presented by H. A. Harriman and D. M. Longenecker of the General Electric Company, West Lynn, Mass., "New Instrument Systems for Recording Turbine Speed, Eccentricity, Expansion and Vibration."

◆ ULTRASONIC CLEANING — National Ultrasonic Corporation, 111 Montgomery Ave., Irvington, N. J., announces the availability of a free 12-page Ultrasonic Cleaning Primer.

The primer provides a clearer understanding of what ultrasonic cleaning is, how it works, areas in which it can be employed, and various solvents and detergents available for use with this kind of equipment.

◆ COAL-FIRED PACKAGED BOILERS — Packaged steam generators have previously been restricted to gas and oil firing in all capacity ranges except very small units. But now fully tested coal-fired units are available in standard sizes of 43,000, 50,000 and 63,000 lb of steam per hour with pressures up to 250 psi.

Designed and developed for the Bureau of Yards and Docks, the water-tubed unit has been operating continuously at 54,000 lb per hour with efficiencies of more than 80%. Performance characteristics are given in Bulletin PG-59-4, Foster Wheeler Corporation, 666 Fifth Avenue, New York 19, N. Y.

◆ ELECTRICAL SNAPSHOTS — A technique approximating horse race photo finish procedure was recently used for permanently recording short circuit test results on third rail systems. The tests were conducted by research engineers of the Chicago Delta-Star Division, H. K. Porter Company, Inc.

Since the readings would appear on a graduated scale for fractions of a second only, a pre-set Polaroid land camera with

(Continued on Page 10)

SPANG Distributor: W. T. Andrew Company, Detroit, Michigan
Mechanical Contractor: Harrigan & Reid Company, Detroit, Michigan

SPANG Pipe gives Rinshed-Mason, paint manufacturers, the top-quality performance they need for their solvent lines.

"In 40 years of buying SPANG, we've never received one foot of defective pipe"

says Mr. William J. Whelan, Purchasing Agent for Harrigan & Reid Company, Detroit, Michigan

SPANG Pipe plays an especially important role at the inert gas reducing station. Any pipe failure in this system could be costly in terms of paint spoilage; finest materials must be used to insure reliable performance.

"*Reliability* is the one word that best characterizes SPANG Steel Pipe" reports Mr. Whelan. "Actually, there are three good reasons why we buy SPANG Pipe: one, SPANG prices are competitive in every respect; two, delivery adheres to promised commitments; three, SPANG quality is consistently high.

"In this piping installation at Rinshed-Mason Company, a major paint supplier for the automotive industry, *top-quality* pipe was especially important. Besides the plumbing and heating systems, we used SPANG Pipe extensively in the paint-processing system. This process piping carries raw materials and intermediate products from storage tanks to weighing tanks, then to production equipment.

"Altogether, approximately 40 different kinds of liquids are carried by this process piping, including vegetable oils, phthalic anhydride, and a variety of 16 solvents."

SPANG CAN MEET YOUR REQUIREMENTS, TOO. Whether you're installing plumbing and heating systems or more demanding systems of process piping, *quality-controlled* SPANG Steel Pipe is your best bet for reliable installations. Call your local SPANG Distributor for the *top-quality* steel pipe . . . SPANG Steel Pipe.

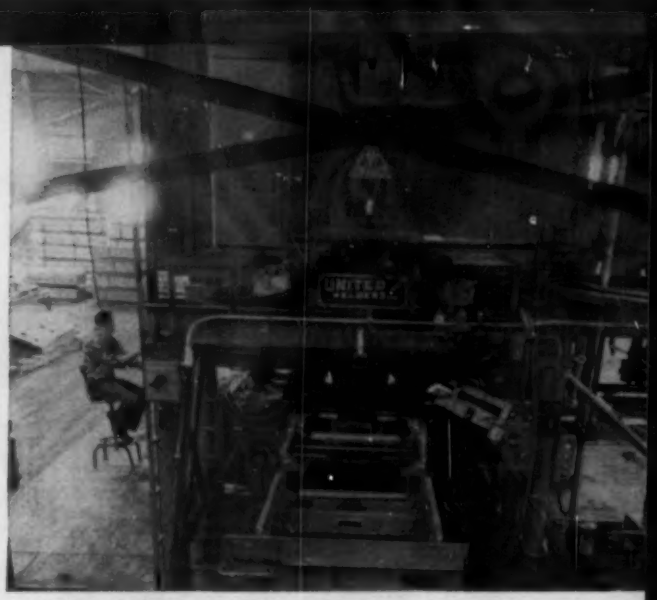
SPANS CW STEEL PIPE

THE NATIONAL SUPPLY COMPANY

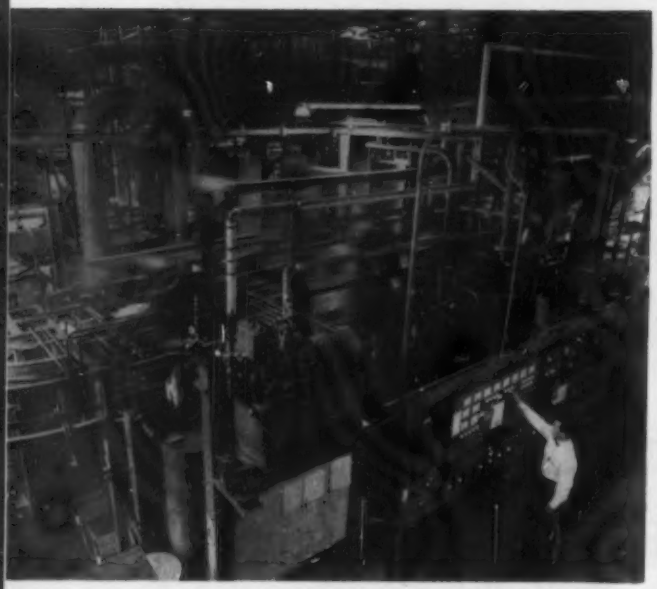
Subsidiary of Armco Steel Corporation

TWO GATEWAY CENTER, PITTSBURGH, PA.

1. Initial stamping. This 850-ton press in the range plant at GE's Appliance Park, turns out range bodies (flat) at the rate of 300 an hour. Used in the press are Gulfcrown® Grease, a Gulf E.P. Lubricant and Gulf Harmony® oil.



2. Welding and forming. After leaving the press, the flats are assembled in an automatic welder-former (background) and proceed on a fully automated line that has over 400 lubrication points, all serviced with six Gulf lubricants.



5. High speed plating. Hydraulic system in foreground provides power to move plated components (such as broiler trays) through plating tanks. Gulf Harmony is the power medium in this and other such plant systems.

6. Completed ranges. Operator tests a removable oven door on a GE range moving along the free standing assembly line. More than 1,600 of these units are turned out daily at GE's Appliance Park.

Large electric range plant meets complex lubrication

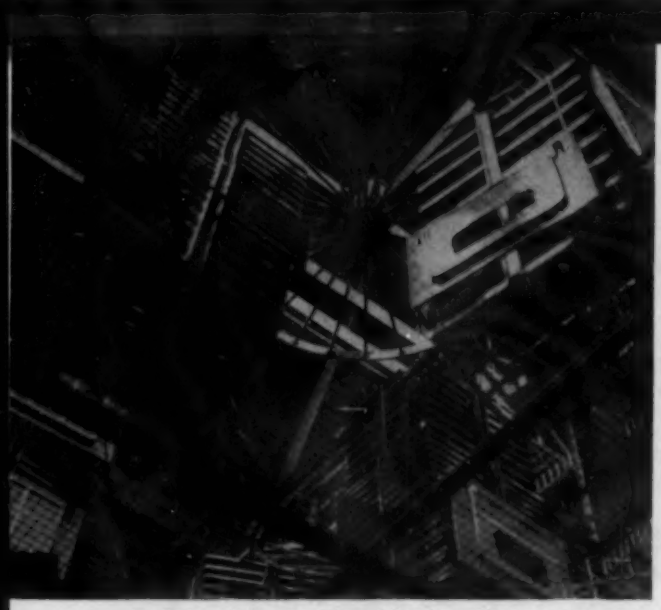
GULF MAKES THINGS

"We turn out more than 1,600 ranges a day in a highly mechanical plant that has thousands of lubrication points. Up until 4 years ago we had the problem of too many lubricants—dozens of them—that had been purchased for specific machines and applications. Each served its purpose well, but handling was complicated.

"A Gulf Engineer—after a comprehensive survey of our lubrication problems—helped us reduce our plant lubricants from dozens down to a total of only six Gulf oils and greases—and helped us set up lubrication schedules that pay off in greater efficiency."

That's the word from W. G. Montgomery, Superintendent of Building, Tools and Equipment in the Range Department of General Electric's huge Appliance Park near Louisville, Kentucky.

Shown above are a few of the highlights in the automated forming and assembly line at the General Electric range plant—where all lubrication needs are met by



3. Automated conveying. 12 miles of conveyors move range bodies automatically. Gulfcrown Grease lubricates conveyor bearings. Gulf Harmony oils are used on chains and sprockets. Gulf E.P. Lubricants on speed reducers.

4. Heat processing. Conveyors take range components past batteries of heat lamps. A special heat-resistant Gulf grease lubricates and protects the free roll bearings. Gulf makes things run better—even when the "heat's on."

7. Scientific lubrication. Three oilers, using the same six Gulf lubricants, service entire automated production line. Daily lubrication is done on second shift. Hydraulic systems are changed yearly during summer shutdown.

8. Gulf man on the job checks with GE man on advantages of simplified lubrication plan. Left, W. G. Montgomery, Superintendent of Building, Tools and Equipment, Range Department. Right, Earl Straub, Gulf Sales Engineer.

demands with six Gulf lubricants . . .

RUN BETTER!

only six basic lubricants recommended by Gulf. With this simplified lubrication plan, this plant not only frees personnel for other work, but reduces both lubricant inventory and purchase costs.

Simplify your plant lubrication with the built-in versatility of Gulf quality lubricants. See how Gulf makes things run better. Just call a Gulf Sales Engineer at your Gulf office. Or, write for bulletins on Gulf Harmony oils, Gulf E.P. Lubricants and Gulfcrown Grease.

GULF OIL CORPORATION
Dept. DM, Gulf Building
Pittsburgh 30, Pa.

GULF

Facts and Trends — Continued from Page 6

Stroboscopic lights was coordinated with the testing action. A precision limit switch triggered the camera's flash attachment at the right instant. This provided, within one minute, an accurate "photo finish" recording of actual test results . . . without human error.

◆ BIG MAGNET — The world's largest permanent magnet is scheduled to work in America's Atomic Energy Program. It is customary to use an electromagnet in pumping the liquid sodium in atomic energy applications, but in this instance a large permanent magnet must be used because it will be completely surrounded by the liquid metal.

The magnet, made by The Arnold Engineering Company of Marengo, Ill., weighs 1,720 pounds, and is made of Alnico V material. The overall dimensions of the magnet are 52-1/2 by 36 by 10 inches. It has a gap length of 16-1/2 inches and a gap volume of 1,584 cubic inches.

◆ TITANIUM — Crane Co. has completed the shipment of seven tons of commercially pure titanium pipe and 60 titanium valves from its Chicago Works to Moa Bay Mining Company, a subsidiary of Freeport Nickel Company, in Moa Bay, Cuba. The piping and valves will be used to convey and to control a highly corrosive acid slurry in a nickel and cobalt ore concentrating facility.

The shipment represents three innovations in the pipe and valve industry: first in the fabrication of titanium metal in eight inch pipe sizes; the successful casting and forging of titanium into valve bodies, and in the shipping of this sensitive metal.

◆ BRUNSWICK, GEORGIA — A significant goal in the economic and physical development of the City of Brunswick, Georgia, was reached when the first shipment to leave the city's new Lanier Dock departed recently aboard the American President Lines' "President Pierce" for Thailand.

Weighing more than 330 tons, the major part of the shipment consisted of the main support steel for a $2.5-million boiler being built by the Babcock & Wilcox Company for the Yanhee Electricity Authority's plant in Bangkok, Thailand's capital and largest city. The material was manufactured entirely at Babcock & Wilcox's boiler division works in Brunswick.

◆ PARR, S. C. — Scientists and engineers are taking nature apart here to determine existing radiation preparatory to construction of the Southeast's first nuclear-fired power plant.

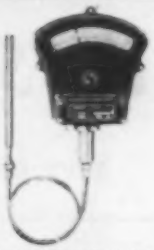
They're "feeding the pig," "gulping air," and "plugging the bird cage" — phrases for their tests of precipitation, temperature, wind currents, soil, milk, surface and ground water and even rabbits and catfish within a 12-mile radius. The mass of resulting data will be used as a guide in construction and operation of the prototype atomic plant being developed by Carolinas Virginia Nuclear Power Associates, a corporation formed by Carolina Power & Light Company, Duke Power, South Carolina Electric & Gas, and Virginia Electric and Power Co.

◆ RIGHTS? — A disturbingly growing number of people are becoming so preoccupied with obtaining what they consider their rights that they are likely to forget they have something even more important than rights: something called responsibilities.

That was the theme of an address made by Arthur V. Wiebel, presdent of United States Steel's Tennessee Coal & Iron Division, to graduating nurses of the Birmingham Baptist Hospitals.

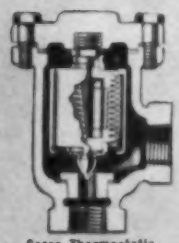
Sarco Type 21 Self-Powered Temperature Regulator

Sarco Type 24-30 Self-Powered Pilot Operated Temperature Regulator

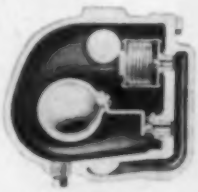


Sarco Type LSI Electric Indicating Temperature Controller

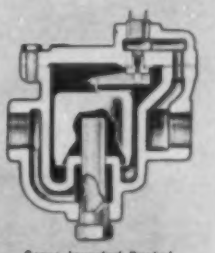
Sarco Thermo-Dynamic Steam Trap



Sarco Thermostatic Steam Trap



Sarco Float-Thermostatic Steam Trap



Sarco Inverted Bucket Steam Trap

Sarco Liquid Expansion Steam Trap

Sarco Pipe Line Strainer

These SARCO products also are available locally

Air Eliminators
Balancing Fittings
Cooling Controls
Compressed Air Traps
Dial Thermometers
Condensate and Vacuum Pumps
Lift Traps
Electric Thermostats and Pressure Switches
Finned-Tube and Baseboard Radiation
Water Blenders
Motor-Operated Valves
Radiator Traps
Radiator Valves
Room Thermostats
Solenoid Valves
Weather-Compensated Heating Control Systems

Depend on your SARCO sales representative to supply you with this complete

SARCO QUALITY LINE

Through your nearest Sarco sales representative, you can get every product in the complete line of Sarco traps, temperature controls and steam specialties. For your convenience, the complete list of Southern States Sarco sales representatives is printed here, arranged by states. SP12-B

These are your SARCO Southern States sales representatives

ALABAMA
Birmingham
Bratton Sales Engineers
Mobile
Bratton Sales Engineers

ARKANSAS
Little Rock
J. L. Brown Sales Co.

D. C.
Washington
Sarco Company, Inc.

FLORIDA
Tampa
O. H. Howell Mfrs. Agent, Inc.

GEORGIA
Atlanta
John F. Templeton Co.

KENTUCKY
Louisville
The Consolidated Engineering Sales Co.

LOUISIANA
New Orleans
Frank A. Birdsong
Shreveport
J. W. Cherry Company

MARYLAND
Baltimore
J. E. Perkins Corp.

MISSISSIPPI
Jackson
Robert Porter

MISSOURI
Kansas City
Smith Steam Spec. Co.
St. Louis
George W. Pieksen

NORTH CAROLINA
Greensboro
Hoffman & Hoffman Co.
Raleigh
Hoffman & Hoffman Co.

OKLAHOMA
Tulsa
Vanco Engineering Co.

SOUTH CAROLINA
Columbia
Hoffman & Hoffman Co.
Greenville
Hoffman & Hoffman Co.

TENNESSEE
Knoxville
G. Walter Sutton & Son
Memphis
J. B. Lammons Company
Nashville
R. E. Gardner Co.

TEXAS
Dallas
Gilbert Engineering Co., Inc.
El Paso
Engineered Equipment, Inc.
Houston
Esch and Associates, Inc.
San Antonio
L. S. Pawkett & Co.

VIRGINIA
Richmond
Robert S. Lovelace Co.

WEST VIRGINIA
Charleston
Angus Gillis & Son

SARCO
COMPANY, INC.
635 Madison Ave., New York 22, N. Y.

the SOUTH—SOUTHWEST

more power . . . more plants . . . more money

Alkylation Unit for Derby — Wichita, Kans.

Construction and testing of **Derby Refining Company's** new 1.4 million dollar hydra floric alkylation unit in **Wichita, Kansas,** was recently completed and the unit has been placed "on stream."

The major product from this new refining unit will be alkylate, a gasoline of high quality, which will be used as a blending stock for regular and premium gasolines.

Derby was the first refinery in the area with the ultraforming process using platinum catalyst for producing high octane gasoline.

New Du Pont Plant Beaumont, Texas

Construction is under way at Beaumont, Texas, on the **Du Pont Company's** new, 50,000,000-pound-a-year plant to manufacture caprolactam, an intermediate chemical for nylon 6 fiber and plastics.

The multi-million dollar plant is expected to be completed and ready to start operations by the end of 1960. Provision for a future increase in capacity has been incorporated in the plant design. The caprolactam and a co-product, cyclohexylamine, will be produced primarily for sale outside the company.

Paper Making Plant Spartanburg, S. C.

P. Garvan, Inc., processor of mill ends and rag waste used in making fine quality papers, is moving its entire plant from Connecticut to **Spartanburg, S. C.,** where construction of a $750,000 plant on a 15-acre tract is under way.

The new 75,900 sq ft plant is being built by Daniel Construction Company of Greenville and occupancy is slated by November 1. The new industry will employ 125 workers, a few of them to be key personnel transferring from Connecticut, but the majority being recruited from this area.

Lithium Corp. Moving to N. C.

Lithium Corporation of America, Inc. is moving its St. Louis Park, Minn., manufacturing facilities, research and development laboratories, and pilot plant to **Bessemer City, North Carolina,** where the company owns large ore reserves and operates a $7,000,000 lithium chemical plant.

Process and equipment improvements, representing advances based on more than 15 years experience in lithium chemistry at St. Louis Park, will be incorporated in the new facilities.

W. R. Grace—S. C.

Daniel Construction Company has begun work on a two million dollar addition to **W. R. Grace and Co.'s** Simpsonville, S. C., Cryovac plant. The expanded facilities are scheduled for completion in 1961.

Gas Transmission Facilities Expanded

Texas Gas Transmission Corporation has a $40,000,000 expansion program under way to serve Hope Natural Gas Company, a subsidiary of the Consolidated Natural Gas Company. Plans include construction of approximately 246 miles of pipeline and an increase of 15,760 hp to the existing system.

Compressor station construction will consist of one new 1,760 hp compressor station near Lafayette, Louisiana, and the addition of an aggregate of 14,000 hp to existing compressor stations at Columbia, Louisiana; Covington, Tennessee; Kenton, Tennessee; Calvert City, Kentucky; Slaughters, Kentucky, and Hardinsburg, Kentucky, for a total of 15,760 additional horsepower to be installed on the Texas Gas system.

Construction of the facilities is scheduled for completion in time for service this winter.

Alabama Power Company

Boston EDISON Company

CENTRAL HUDSON

NIAGARA MOHAWK

PHILADELPHIA
ELECTRIC COMPANY

AS STEAM PIPING BECOMES MORE CRITICAL

KELLOGG'S

FABRICATION-

ERECTION

SERVICES

KEEP PACE

No designer-fabricator-erector of power piping has worked so closely with the industry as Kellogg to meet the increasingly more critical steam pressure/temperature requirements of the nation's electric utilities.

Long a leader in the application of the newer alloys, and in the development of better welding materials and welding techniques for the power generating industry, Kellogg is today privileged to announce more than a dozen projects concurrently executed with the *five* major utilities, listed above. Each of these major assignments includes the use of Kellogg's K-Weld® technique for welding the main steam and other critical lines, both in field erection and shop fabrication.

Kellogg welcomes inquiries on its complete fabrication and erection service to the power piping industry from consulting engineers, engineers of power generating companies, and manufacturers of boilers, turbines, and allied equipment.

Fabricated Products Sales Division, THE M. W. KELLOGG COMPANY, 711 THIRD AVENUE, NEW YORK 17, N. Y.

A SUBSIDIARY OF PULLMAN INCORPORATED

The Canadian Kellogg Co., Ltd., Toronto • Kellogg International Corp., London • Kellogg Pan American Corp., Buenos Aires • Societe Kellogg, Paris • Companhia Kellogg Brasileira, Rio de Janeiro • Compania Kellogg de Venezuela, Caracas

POWER PIPING—THE VITAL LINK

®*Registered trademark of the M. W. Kellogg Company, Process Patented*

News of the South-Southwest — more power . . . more plants . . . more money

Lewis-Shepard—Kans., Mo.

Robert L. Means has become associated with **E. Sharp and Associates, Kansas City, Missouri,** representatives for the Lewis-Shepard line of electric fork lift trucks and related materials handling equipment.

Prior to becoming associated with E. Sharp and Associates, Mr. Means was assistant to the Vice President and General Sales Manager at the home office of Lewis-Shepard Products in Watertown, Mass.

Reynolds Aluminum Supply Richmond Branch

Three new additions to Reynolds Aluminum Supply Company's Richmond Branch staff were announced recently. **Edward B. Rogers,** until recently a territory salesman working out of Richmond, has been named Assistant Branch Manager and will be responsible for operations and inside sales.

Eugene Haacke is now industrial sales representative for the State of Virginia, and **Alan Treewalla,** inside salesman.

Melpar Plant Addition Falls Church, Virginia

Melpar, Inc., a subsidiary of Westinghouse Air Brake Company, awarded a $2,400,000 building contract to the George A. Fuller Construction Co. of New York for a 120,000 square foot, 3-story addition to the **Falls Church, Virginia,** headquarters plant. The completion date has been set for September 1960.

Shell Oil Co. Texas Expansion

The **Fluor Corporation, Ltd.** has been awarded a $2-million contract by **Shell Oil Company** for the engineering, procurement and construction of a distillate hydrotreater unit in Shell's Deer Park, Texas refinery.

Detailed design and purchasing for the hydrotreater will be handled by Fluor's Mid-Continent Division in Houston, Texas.

Construction of the 30,000 barrels-per-stream-day facility will begin in November, with completion scheduled for April 1960.

G-E Southern District Metallurgical Products

C. W. Powell has been appointed manager, Southern District, for Metallurgical Products Department of

the **General Electric Company,** with headquarters in Atlanta. The area includes all of the Southeastern States, parts of Kansas and Missouri, and the States of Oklahoma, Texas, and New Mexico.

Mobay Chemical — W. Va.

The appointment of **W. P. Dunlap** as manager of **Mobay Chemical Company's** plant at **New Martinsville, W. Va.,** was announced recently.

Mr. Dunlap succeeds **Donald J. Miller,** Mobay plant manager since 1954, who has accepted a position with Monsanto Chemical Company's Plastics Division in Texas City, Texas.

C. R. Morton succeeds Mr. Dunlap as production superintendent. Other new assignments are: **R. M. Ewald,** general operating supervisor, and **J. W. McCrackin** who has been appointed to the new position of polycarbonate supervisor.

Goulds Pumps, Inc. South Central States

In order to better serve its industrial customers in the South Central states, **Goulds Pumps, Inc.,**

has opened a branch office in Shreveport, Louisiana. **T. G. Kelley,** a veteran of 30 years with Goulds, will manage the office located at 1007 Petroleum Tower. He was formerly manager of the company's Houston branch office.

Ford-Lynch — Atlanta

Robert S. Lynch, former Chairman of the Atlantic Steel Company, has joined with **Frank F. Ford,** President of Frank F. Ford and Associates, and Ford Supply Co., to form Ford-Lynch Associates, consultants and sales engineers. Offices of this new Southeastern organization are located at 1015 Chattahoochee Avenue, N. W., Atlanta, Georgia.

Allis-Chalmers—Knoxville

Appointment of **Albert R. Knauss** as Knoxville district manager has been announced by Allis-Chalmers Industries Group.

Knauss had been manager of the Boston district since 1952 and was manager of the Memphis district for six years before that. He joined Allis-Chalmers in 1936.

Steel and masonry are combined here for an attractive plant. This Armco Building has 100-foot clear span width.

For economy and quality specify Armco Steel Buildings

Whether you are planning an office building, warehouse, gatehouse or an entire plant, you can meet your exact needs with an Armco Steel Building. Specify exactly what you need from thousands of sizes of Armco Buildings—each with an unequalled selection of accessories, doors, windows and other special features that give you an economical finished structure tailored for your operations.

You get a high-quality building, too. STEELOX® wall panels lock together to form a tight weatherseal. Heavy-gage walls are up to twice as thick as ordinary steel covering.

Interiors can be insulated and completely finished with standard material. Exteriors take any kind of architectural treatment.

Armco STEELOX construction withstands heavy wind and snow loading . . . lasts indefinitely. There's nothing to warp, crack or burn. Maintenance costs are practically eliminated.

For complete information on Armco Steel Buildings, use the coupon. Armco Drainage & Metal Products, Inc., P. O. Box 1343, Atlanta, Georgia, or C&I Life Building, Houston, Texas. Other offices in principal cities.

ARMCO DRAINAGE & METAL PRODUCTS, INC.
(Mail to office nearest you. See above.)

Send me data on Armco Steel Buildings for the following uses:

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Approximate size_____

Name_____

Address_____

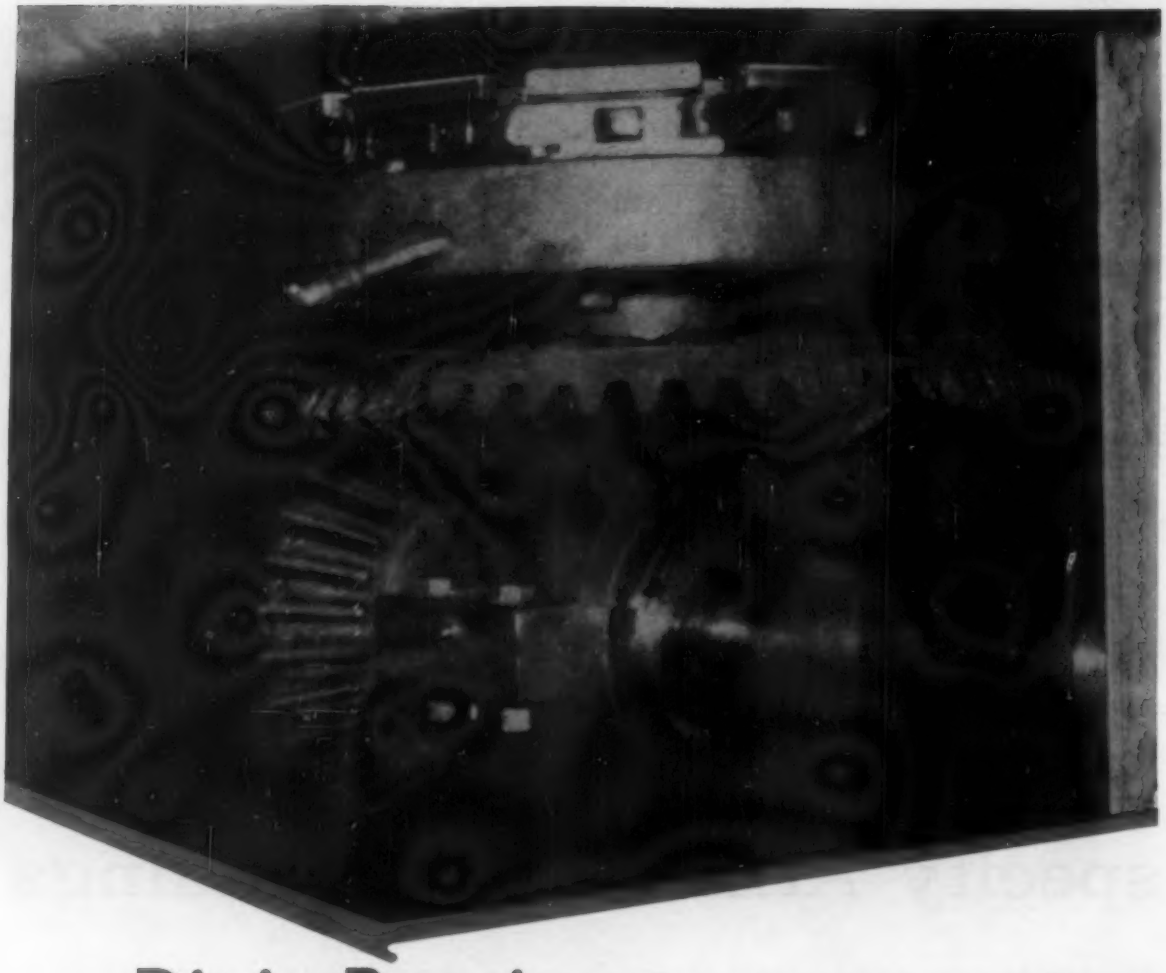
City_____ Zone_____ State_____

FINANCING ARRANGEMENTS AVAILABLE

ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
The Armco International Corporation • Union Wire Rope Corporation



a Dixie Bearings conversion with a 2 year record of no lost production, reduced maintenance . . . and a 30% Power Savings!

Over two years ago our engineers converted this main drive gear from a babbitt bearing to a ball bearing unit on a machine at Highland Park Manufacturing Company, Charlotte, North Carolina. Performance of this conversion, according to company engineers, has been outstanding! The housing for the bearings as well as the gear hub was produced by the customer in their own machine shop.

Prior to conversion, machine downtime was excessive because the babbitt had to be repoured every three or four months. A plus saving was in the reduction of power required to operate the machine. Highland Park Manufacturing Company officials now find power consumption is 30% less!

If your older equipment can be modernized with anti-friction bearings — our engineers can show you how. If you need bearings for any purpose, our stock carrying branches can supply you. We are *authorized* distributors of most nationally known makes of bearings. We and the makers guarantee every bearing we supply — Call the branch nearest you now!

Providing bearing service in the South

DIXIE BEARINGS, INC.

FLORIDA: Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville
LOUISIANA: Baton Rouge • New Orleans • **N. CAROLINA:** Charlotte • Greensboro
S. CAROLINA: Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville
VIRGINIA: Richmond

News of the South-Southwest — more power . . . more plants . . . more money

G-E Insulator Department Baltimore, Maryland

The Insulator Department, General Electric Company, Baltimore, Maryland has appointed **F. R. McVicker,** Manager — Product Planning Marketing Research, Advertising and Sales Promotion.

Formerly District Manager of the Department's St. Louis, Missouri sales district, Mr. McVicker replaces Mr. D. R. Samson, who has accepted an assignment with General Electric's Power Transformer Department in Pittsfield.

Induction Heating Houston, Texas

Electronic Heating Engineers Inc., 6523 Eppes, Houston, Texas, is a new firm serving the Gulf Coast, Dallas and Shreveport areas, to provide induction heating processes for industries of all types. Richard B. Magerman is general manager.

Stoops Products Engr. Rockwell Tulsa Div.

Bobby G. Stoops, assistant chief engineer at **Rockwell Manufacturing Company's Instrument Division** in

Tulsa, Oklahoma, has been promoted to chief products engineer.

Mr. Stoops joined Rockwell in 1955 as a design and development engineer and was promoted to his most recent position in 1957. He is a mechanical engineering graduate of Oklahoma State University and a member of the National Society of Professional Engineers.

James S. Taylor

Wayne Lutke

Graver — Southwest

James S. Taylor and **Wayne Lutke** have been named to new posts in the expanding oil and gas equipment sales operations of Graver Tank & Mfg. Co., East Chicago, Ind., a division of Union Tank Car Company.

Taylor becomes sales engineer for Graver oil and gas equipment, operating out of **Tulsa, Okla.,** and Lutke has been named district manager at **Midland, Texas.**

Parker-Hannifin — Tenn.

Franchisement of **Ridge Instrument Company,** 162 Talmeda Road, **Oak Ridge, Tennessee,** as a distributor of industrial tube fittings and tube-working tools has been announced by Parker-Hannifin Corporation, Cleveland, Ohio. Dallas Yeager is owner of Ridge Instrument Company.

Southeastern Manager for Jamesbury Corp.

Appointment of **W. G. "Bill" Hurd** as S. E. District Manager is announced by Jamesbury Corp. From his headquarters in Atlanta, Georgia, Mr. Hurd will service commercial installations of Jamesbury "double-seal" ball valves and hydraulic devices.

Mr. Hurd was formerly a partner in a mechanical contracting firm in Tampa, Florida. A member of the National Association of Power Engineers, his background includes both mechanical and air-conditioning engineering.

B-I-F Industries Carolina Representative

B-I-F Industries, Inc., of Providence, R. I. recently announced expansion of the area served by **W. D. Taulman and Associates** of Atlanta, Georgia, as sales representatives for

their extensive line of process instrumentation and equipment for positive control of materials in motion. Addition of the State of North Carolina and the northern portion of South Carolina makes Taulman B-I-F representative for the entire Southeast. The new area will be served by their Charlotte, N. C. office at 304 Builders Bldg., where **Wiley T. Baker** is manager.

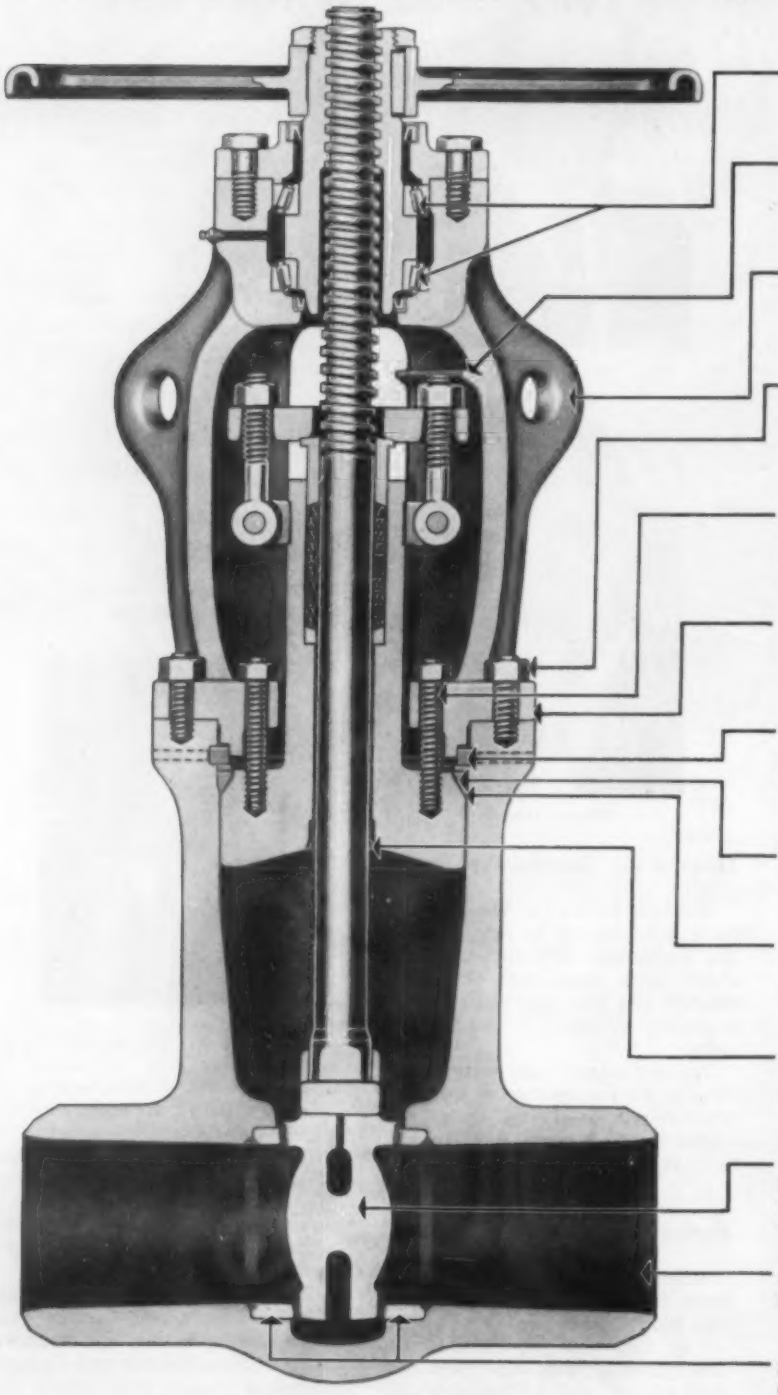
Personnel of W. D. Taulman and Associates have over sixteen years of experience in sales and service of B-I-F Meters, Feeders and Controls, including gauges, flow meters, control valves, recorders, telemetering systems, etc.

(*Continued on Page 20*)

POWELL PRESSURE SEAL VALVES

GATE, GLOBE, ANGLE and CHECK PATTERNS

Pressure Classes . . . 600, 900, 1500, 2500 Pounds and Higher . . . ALL COMMERCIAL SIZES



Tapered roller bearings are most satisfactory for high thrust loads.

Lugs on the inner side of yokearms provide a convenient shelf for suspending gland flange when renewing packing.

Lifting lugs facilitate handling the valve during erection and maintenance. Also provide means for supporting weight of the valve.

Body studs hold the yokearm to the body. These eliminate the need of a heavy clamp, and maintain perfect alignment and rigidity of yoke to the body.

Bonnet studs are used to establish the initial seal of the gasket between the body and the bonnet.

Streamline contour of body simplifies application and reduces cost of insulation, and effects marked savings in space and weight.

Segmental thrust ring absorbs all the thrust applied by internal pressure. This design enables valve to be easily assembled and disassembled.

The gasket may be removed without damage to seating surface of body.

The gasket seating surface in the body may be easily lapped, if required—an outstanding feature in Powell Pressure Seal Valve design.

Stellite faced back seat and stem guide insure tight sealing, accurate guiding of stem and protects packing when valve is back seated.

Flexible "H"-type wedge, which is stellited, prevents sticking because of temperature changes and pipe line stresses, thus reducing opening torque.

Streamlined passage makes possible maximum flow with minimum turbulence.

Seat Rings are stellite faced, accurately machined and welded in place.

(Sectional) PRESSURE SEAL GATE VALVE

THE WM. POWELL COMPANY • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**

Densheath 900 installation in a paper mill. The tough insulation on this new 600-volt wire makes it particularly suited for chemical plants, refineries, and paper mills.

FOR YOUR 600-VOLT INDUSTRIAL WIRING NEEDS...

ANACONDA DENSHEATH 900

OFFERS: LONG LIFE... HIGH HEAT- AND MOISTURE-RESISTANCE... CHEMICAL STABILITY... EASY INSTALLATION

And its multiple ratings give you an added advantage! Densheath* 900 retains its electrical and physical properties despite exposure to heat, moisture, cutting compounds, lubricants, most acids and alkalies. It has proved itself again and again—even in the most critical spots. It withstands rough handling without tearing or abrading. Densheath 900 is flexible and strips easily. It's easier to install.

Special heat-resistant insulation safely permits higher currents under exposure to higher ambient temperatures than is possible with ordinary PVC thermoplastic materials.

As a result, Densheath 900 is approved not only for use as TW... but also for machine-tool applications and 90 C appliance wiring. These multiple ratings make one stock possible, eliminating the need to carry separate inventories of each type of wire.

For full information, or to order, call the Man from Anaconda or your Anaconda distributor. Also—write for descriptive bulletin DM-5612. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

*Reg. U.S. Pat. Off.

ASK THE MAN FROM

ANACONDA®

FOR DENSHEATH 900 WIRE

News of the South-Southwest — more power . . . more plants . . . more money

Hitch Heads Public Utilities Assn. — Va.

H. Atwood Hitch, vice president of the Virginia Electric and Power Company, was elected president of the **Public Utilities Association of the Virginias** at the group's 41st Annual Meeting at White Sulphur Springs, West Virginia. Mr. Hitch succeeds **Hugh D. Stillman,** division manager, Appalachian Power Company, Huntington, West Virginia.

Carpenter Steel Names Boyd — Atlanta

The Carpenter Steel Co., of Reading, Pa., has promoted **A. Richard Boyd** to district manager of its **At-**

lanta, Ga., territory. Mr. Boyd now manages the company's Atlanta warehouse and is responsible for sales of Carpenter specialty steels in six Southern states. He is very active in the American Society for Metals and is a past chairman of the Atlanta chapter.

NACE Seeks Technical Papers

Technical papers on various aspects of corrosion control are solicited for presentation at the 1960 Annual Conference of the **National Association of Corrosion Engineers** to be held March 14-18 at Dallas, Texas.

Chairman of the 1960 Conference technical program is S. K. Coburn, 3140 South Federal Street, Chicago, Illinois. Co-chairman is David K. Priest, Pfaudler-Permutit, Incorporated, 1000 West Avenue, Rochester 11, New York.

Edward Valves — Kan., Mo.

Rhein Benninghoven has been named sales representative for the Kansas-Missouri-Nebraska area of **Edward Valves, Inc.,** manufacturers

of cast and forged steel valves. Mr. Benninghoven, district sales manager for **Republic Flow Meters Co.** of Chicago since 1931, will continue in that capacity. His offices are at 4550 Main St., **Kansas City, Mo.**

Morse Twist Drill and Machine Co.—S. W.

The appointment of **Gorden Wade Davis,** Houston, Texas, to Southwestern sales representative for **Morse Twist Drill and Machine Co.** was announced recently.

Mr. Davis has had many years experience in the machine tool and supplies field and is a member of the American Society of Tool Engineers.

Hoerner Boxes—Miss.

Forrest R. Hamilton has been named manager of the new Tupelo, Miss., sheet plant scheduled for opening in October by Hoerner Boxes, Inc. Mr. Hamilton, who has been with the company since 1956, formerly represented Hoerner's Little Rock, Arkansas plant in the northern Mississippi area. **Carl Schmidt, Jr.,** is plant superintendent, and **Philip Cosgriff** is office manager.

FUTURE EVENTS of Engineering Interest

Nov. 5-6: 8th Annual Instrumentation Conference, School of Engineering, Louisiana Polytechnic Institute, Ruston, La. Stewart Baggarly, Publicity Chairman, 8th Annual Instr. Conf., Louisiana Polytechnic Institute, Ruston, La.

Nov. 16-20: 5th International Automation Exposition & Congress, New York Trade Show Bldg., 500 Eighth Ave., New York, N. Y. Richard Rimbach Assoc., Inc., 845 Ridge Ave., Pittsburgh 12, Pa.

Nov. 20: NGAA Panhandle Plains Regional Meeting, Herring Hotel, Amarillo, Texas. Wm. F. Lowe, Exec. Dir., Natural Gasoline Assn. of America, 421 Kennedy Bldg., Tulsa 3, Okla.

Nov. 30-Dec. 4: 27th Exposition of Chemical Industries: New York Coliseum. E. K. Stevens, Mgr., 27th Exposition of Chem. Ind., 480 Lexington Ave., New York 17, N. Y.

Jan. 25-28, 1960: Plant Maintenance & Engineering Show, Convention Hall, Philadelphia, Pa. Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Feb. 1-4, 1960: 2nd Southwest Heating & Air-Conditioning Exposition, Dallas, Texas. E. K. Stevens, Pres., International Exposition Co., 480 Lexington Ave., New York 17, N. Y., Mgr.

Feb. 1-5, 1960: 4th National Industrial Electric Heating Conference, Cincinnati, Ohio. The Industrial Electrification Council, 750 Third Ave., New York 17, N. Y.

April 27-29, 1960: Sixth Annual Instrument Society of America Conference and Exhibit, and First Pulp and Paper Division Symposium, Pensacola, Florida. G. W. Howlett, P. O. Box 4426, Pensacola, Florida.

May 9-13, 1960: Southwestern Metal Exposition. Automobile Bldg., State Fair Park, Dallas, Texas. American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.

(*Continued on Page* 73)

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INDUSTRY SPEAKS

Du Pont Now Has Six Plants in Tennessee

Abstract of a Speech by ROBERT L. HERSHEY, Vice President, E. I. du Pont de Nemours & Company, on the Occasion of the Opening of the Johnsonville Plant, New Johnsonville, Tennessee.

WHILE WE MEET HERE today to take note of a brand new industrial establishment in Tennessee, we are really witnessing the turning of just one more page in a long story of mutual interest and respect. Here is an up-to-date accounting of Du Pont in Tennessee.

First, we have the Old Hickory rayon plant, built in 1924. At the same site there is now under construction a plant to manufacture "Dacron" polyester fiber, the man-made fiber that makes possible "wash-and-wear" clothing. The separate cellophane plant, built at Old Hickory in 1928, has since that time increased its capacity many fold and has been extensively modernized. Soon there will be a third major plant in operation at Old Hickory—an installation to manufacture chemical intermediates for "Dacron."

Just after World War II, the Chattanooga nylon plant was erected. Since start-up in 1948, there have been five expansions at that site alone, including the addition of facilities to make nylon tire cord yarn.

Next came the electrochemicals plant at Memphis, built near the site of the Chickasaw Ordnance Works which Du Pont operated for the government in World War II. Memphis, completed in 1951, has been expanded at least three times for new products, and is currently involved in a fourth new unit to make the intermediates for "Orlon" acrylic fiber.

In 1952 a cellulose sponge plant was built at Columbia. The plant we nonor today is located on the company's fifth separate location.

So far we have touched on bricks and mortar. Let's take a quick look at the economic side. As you might guess from what I have already said, our investment in these large plants runs into many millions of dollars.

In 1958, the company paid its 7,000 employees in Tennessee well over $36 million in wages and salaries. These figures do not include the payroll of the Johnsonville Plant, which should run about $2½ million a year for its 425 employees. But payrolls are not the only measure of industry's contribution to the state's economy. Another measure is the purchases made by the various plants from local businesses. Last year, again excluding Johnsonville, the Tennessee plants purchased goods and services in the amount of $12,600,000 from 2,300 individual firms, most of them small local businesses.

These figures are, of course, over and above the more than $2 million annually the company pays within the state in direct taxes for essential community and state services.

We have built here what we firmly believe is the world's most modern unit for the production of titanium dioxide pigment. Eight years of research and technical programming plus millions of dollars went into the development of the new chloride process which has been installed at this plant. It is the newest thing in the titanium dioxide industry. If operated at high volume, the new process offers substantial operating economies. In addition it produces a pigment with markedly improved properties for certain uses.

The plant is well located both from the viewpoint of supply and of markets. We can expect a long and prosperous life for the plant, with the distinct possibility of substantial expansions and more jobs as the demand for its product increases.

The optimism I have expressed is, of course, based on certain assumptions — things we confidently expect to happen, but for which we possess no guarantee. These assumptions include for example: continued operation with maximum of labor-management cooperation; the maintenance of a strong position in the market place; the continued technical superiority of our product. But above all else, if this bright future is to be a reality, the New Johnsonville operations must earn a profit.

The hope of a fair return on our investment was the spur that set in motion the long chain of events which culminated in the construction of this plant. If events should show that we were wrong in our expectation that the plant will earn a profit, there will be much disappointment. Perhaps most disappointed of all will be the Federal Government, which, whether the profits be large or small, gets 52 per cent of what is earned.

Good profits and good personal earnings and wages, bringing in more taxes, are the foundation for support of our Government in all its many activities.

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We feel confident that you can find the coal best suited to your needs among the many fine coals mined along the lines of the N&W. These coals, known collectively as Fuel Satisfaction, are mined by the most modern methods, prepared in plants that are electronic marvels. They are helping many of the nation's leading coal users to operate at maximum efficiency.

But whether or not Fuel Satisfaction is your choice, you can be sure of an objective, analytical approach to your coal problems. For competent assistance and advice, get in touch with one of the N&W coal bureaus listed here.

Norfolk and Western RAILWAY

CARRIER OF FUEL SATISFACTION

TIMELY COMMENTS

Preferred Design Transformers

PERHAPS NO SEGMENT of big business has been so successful in the fight against inflation as has the electric utility industry. This accomplishment has been largely through continuous improvement in design and operation to offset increasing labor and material costs. Close cooperation between utility engineers and equipment manufacturers continues to improve operating economy — while holding capital cost more nearly in line than other industries. The utility customer can still buy a mighty cheap kilowatt hour.

The latest important link in this improvement chain was recently presented at an industrial press conference when General Electric Company announced a revolutionary new program in the design and manufacture of power transformers which it believes will help electric utilities in their long-range fight against inflation.

The program will provide an average reduction in published prices of more than five per cent for the entire line of power transformers, according to J. W. Seaman, general manager of the company's Power Transformer Department.

The new program, called "Preferred Design," applies to huge power transformers weighing as much as 200 tons, which are used by utilities for raising or lowering the voltage of a power system.

Previously, Preferred Design was applied by General Electric only in the manufacture of much smaller power transformers. Now under Preferred Design are giant units rated up to 250,000 kilovolt-amperes.

Basically, Preferred Design cuts costs by manufacturing transformers which have a uniform exterior design. This radical departure from the old job-shop method of custom-building transformers permits mechanized production-line techniques which will permit manufacturing economies — helping to stabilize inflationary tendencies caused by ever-rising labor and material costs.

These price reductions reflect savings in engineering and production costs on the new designs, greater technical knowledge of extra-high voltage units and customer acceptance of the new Preferred Design program.

The degree of success that can be obtained in holding down prices in the future will depend upon the degree to which inflation continues, and the extent to which the utility industry gives its volume support.

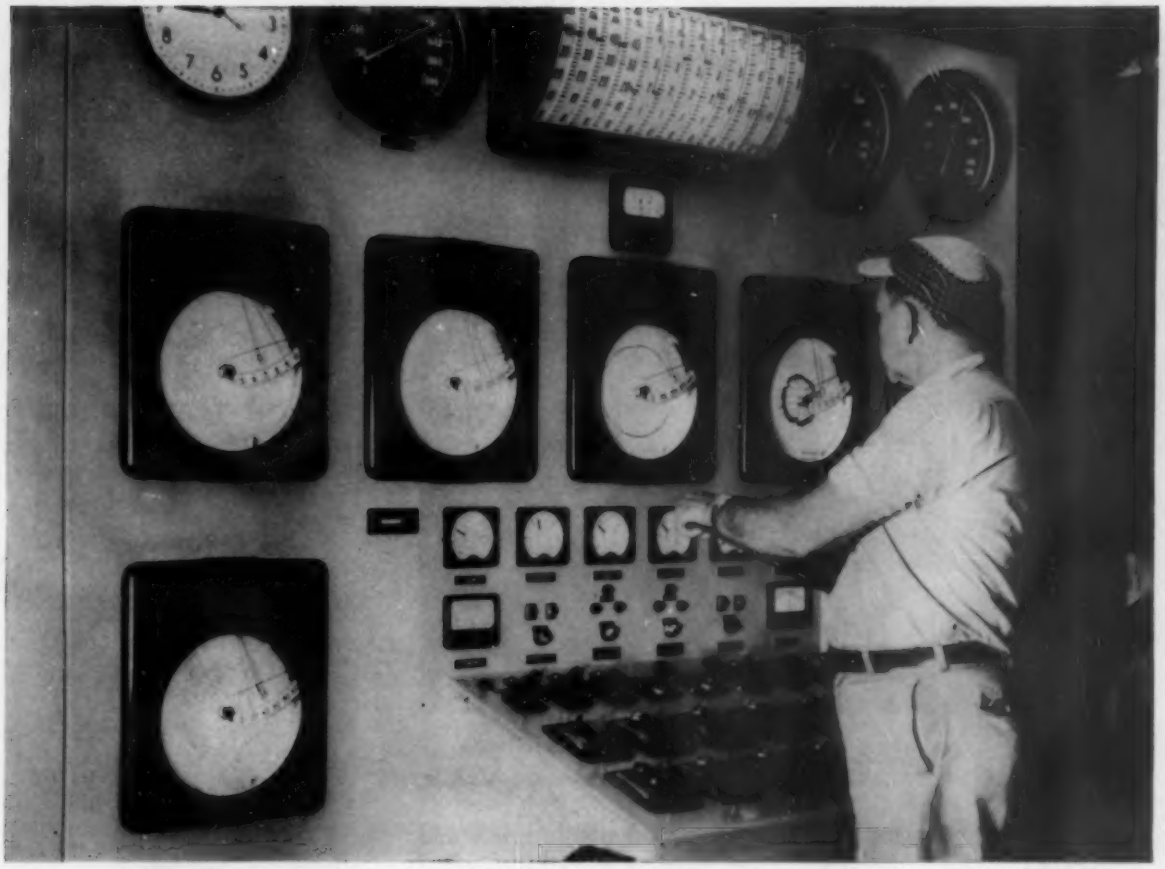
The new system replaces old job-shop methods of transformer manufacture where one operation had to be completed before the next began. Now work can be done on several components simultaneously — subassemblies such as fans and radiators can be built and joined to the basic units later, thus simplifying and speeding up the entire assembly operation.

An important result of this product uniformity is that a giant 705 computer can be used in design work to automate much of the routine overhead. Calculations which formerly required hundreds of man-hours can now be accomplished in minutes.

The computer can make 8,400 additions, 1,500 multiplications, and 29,400 "local decisions" per second. It can receive data at the rate of 15,000 characters per second from magnetic tape or 20,000 characters per second from punched cards. It can "read" all 40,000 positions in its magnetic core "memory" in one second.

Selection of the uniform mechanical arrangements was made after extensive surveys of utility preferences and past orders. These form the basis for "programming" the computer to do complex design calculations. Flexibility of the computer allows it to supply design data for any transformer rating with equal ease — whether the rating is 20,000 kva or 125,350 kva.

In addition to helping fight inflation, Preferred Design has many other immediate benefits to utilities. Some of these include: greatly improved delivery schedules, faster substation design construction, and much easier installation and maintenance resulting from uniform mechanical features and accessories. Many accessories and features which were formerly supplied only at extra cost to the customer are now included as basic equipment.



Control Room for Cyclone Furnace Boiler at Mathews No. 2 Power Plant of Greenwood Mills, Greenwood, S. C. Bailey MINI-LINE System concentrates controls at operator's station.

How BAILEY simplifies operation of STEAM PLANTS

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A138-1

Instruments and controls for power and process

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The Individual — Key to Productivity

A supervisor conducting the all important appraisal interview

By LEON J. SMITH, JR.
Personnel Development and
Employee Communications Manager
The Chemstrand Corporation
Decatur, Alabama

Today's competition, coupled with rising cost of materials and services, has given increased importance to individual performance.

THE CHEMSTRAND Corporation has long been aware of the importance of individual performance to productivity. It recognized that machine output can be measured with scientific accuracy, but that human performance is limited by the will of the individual.

Management's task, in the plants and offices of this chemical fiber producer, is to stimulate in employees the desire to improve their performance. Merely knowing that improvement is possible and how it can be achieved is sufficient motivation for many employees. So one method of improving performance is the continuous and systematic appraisal of employees.

Under guidance of the Corporate Personnel Relations Department, a study of the various systems used in business, industry, and government revealed systems ranging from the simple laundry list of personality characteristics to the unwieldy and time-consuming panel review.

The objective of the personality check sheet appeared to be one of molding each employee to company specifications while the panel review seemed to be an attempt at objectivity. The check sheet requires little time or thought to complete while the panel serves as a convenient scapegoat should the employee's performance be criticized.

Performance Appraisal

The Chemstrand approach is based on the objective of performance appraisal — improving the individual's performance of the responsibilities, duties, and tasks assigned to him.

These responsibilities, duties and tasks are listed in the job description which has been useful in recruitment and selection, job evaluation, training and organization.

Each Chemstrand supervisor uses the job description as the first step in performance appraisal. From this he lists each element of the job and then describes the employee's performance of that element. Proponents of other systems point out that personal bias or prejudices colors the supervisor's judgment. To temper inequities the written appraisal is reviewed and discussed with the supervisor's imediate superior.

The next step is the all important interview in which the supervisor and the employee being appraised meet privately to discuss the appraisal, item by item. The important consideration is the man-to-man communication between supervisor and subordinate.

In the next step, the objective comes into focus. The supervisor and employee develop a mutually agreed upon plan of improvement. This plan is based upon the needs indicated by the appraisal and must be within the reach of the employee.

One additional step is necessary if the appraisal is to be effective. The supervisor must follow-up by guiding, assisting, and counselling

A sample performance appraisal

the employee without appearing to push.

The frequency of appraisal will depend upon the complexity of the job, but it is usually on an annual basis.

This system is relatively new at Chemstrand, but since its introduction, supervisors have received numerous requests for appraisals from the employees themselves. Many supervisors have commented on the superiority of the system over those used previously and it has been found that there are many supplementary benefits to be derived from the performance appraisal program.

The supplementary benefits include:

1. The program tends to create or reinforce communications between supervisor and employee.

2. It provides a written record of the supervisor's opinion of an employee's performance. Though the supervisor may tell an employee how he is doing, the employee likes to have it in writing.

3. The appraisal serves as justification for personnel actions such as promotions, transfers, merit increases, and discharge.

4. It makes the employee feel that the company is interested in him as an individual and gives him a sense of belonging.

5. Finally, and probably most important, it shows the employee exactly what he can do to insure his security for the future.

Chemstrand believes that any one of the supplemental benefits is sufficient justification for a performance appraisal program. While any program may be considered better than none, today's competition demands that the best method be used. With this in mind, a careful and thorough study of the programs operating in business and industry today has indicated to the Corporation that the approach described is the most practical and acceptable method for individual improvement and increased productivity.

Output Check for Deep Well Pumps

FORMERLY we tested our deep well pumps by the volume added to a calibrated reservoir. This method required approximately 16 man-hours on each pump, including calculations.

The orifice method now employed requires approximately four man-hours for each pump, including calculations. The results obtained are very satisfactory, when compared to the volume method previously employed. With the orifice method all pumps remain in service except the one being tested.

A temporary discharge connection is made on the top of the check valve (with flapper removed) in main pump discharge line. Laboratory test gages are used to record the test pressures. The pump discharge pressure is varied as necessary by a gate valve. Drawdown on the well is checked in the usual manner, with the pump in continuous operation.

Pump discharge is measured by a calibrated orifice installed at the outer end of the temporary discharge line. With a test gage to give pressure at the orifice, the discharge can be calculated from a standard formula or taken from tables provided for the particular orifice used. Naturally, it is necessary to choose an orifice that is appropriate for the range of flows encountered.

By GEORGE G. AVANT
Wilmington, North Carolina

Improved Instrument Maintenance

The portable cart

Saves Labor and Increases Production

By
R. M. LADY, Industrial Instrument Engineer
and
R. G. MATTHEWS, Plant Electrical Engineer
Lockheed Aircraft Corp., Marietta, Georgia

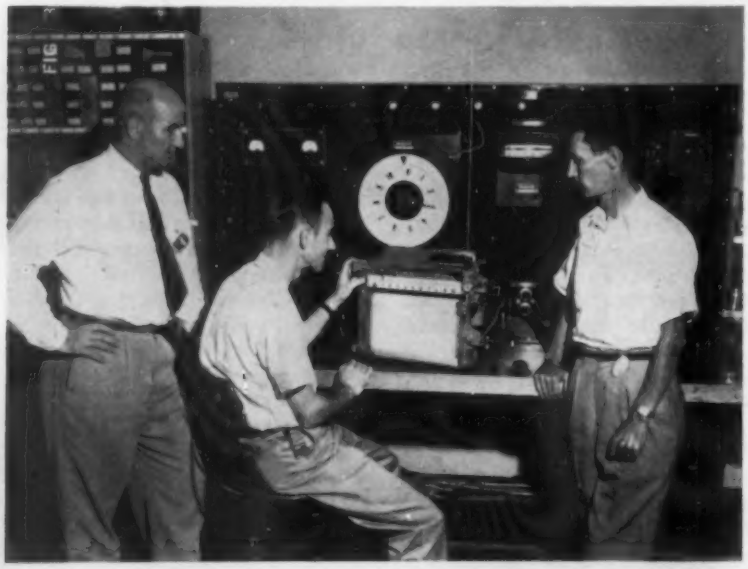
LOCKHEED Aircraft Corporation engineers have come up with a new plan of instrumentation maintenance that will save the Marietta, Ga., plant more than $8,000 annually in labor alone in the heat-treating department. The new plan will pay for itself in less than one and one-half years.

At this aircraft plant which manufactures prop-jet C-130 carriers, JetStar executive jet planes, and modifies B-47 jet bombers, the plant engineering group was confronted with the problem of maintaining peak heat treating production without sacrificing the extremely high quality standards demanded by the aircraft industry.

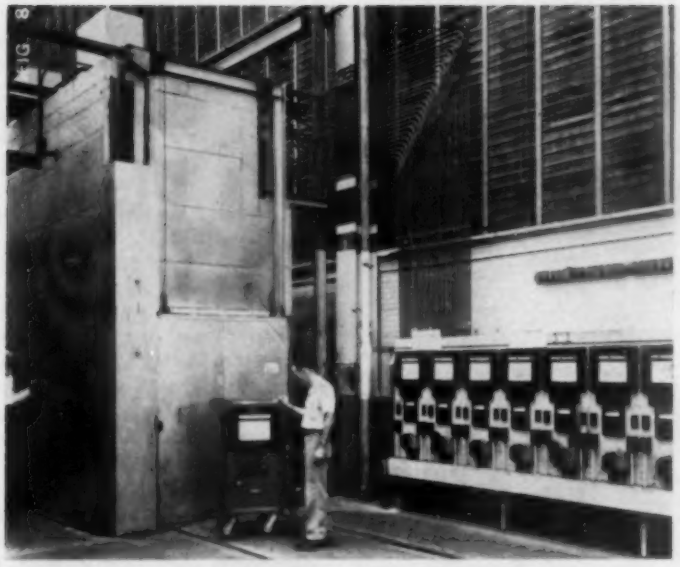
After a detailed study, they made changes in instrument calibration and maintenance methods and procedures which have actually increased production, at the same time improving quality and cutting operating costs.

The cause of the problem was the aircraft industry's continued search for stronger and lighter materials. As the requirements for these materials become more and more exacting, so, also, do the requirements for the precision and reliability of the heat treating equipment in which the materials are processed.

Although both precision and reliability can be obtained originally as characteristics of new equipment, neither can possibly be maintained without adequate calibration and maintenance of the instruments that measure and control the critical heat treating temperatures.



Worker checking instrument in laboratory



Cart at furnace with probes inserted

Herein was the problem. Under the old method, we were able to meet the precision and reliability standards, but only at the expense of losses in production. For example, each furnace had to be shut down periodically while its control instruments were being overhauled, cleaned, and recalibrated. This, of course, posed difficulties for the production department, which was required to maintain scheduled operations with less equipment.

The job of the maintenance department, working under pressure and away from full laboratory facilities (since the instruments were serviced at the furnace locations), was less efficient.

Under the old plan, one technician — using a single probe — made successive tests by inserting the probe into holes on the furnace. Another technician, using an indicating potentiometer, recorded millivolt readings, each time compensating for variations in ambient temperature.

This required several hours, and was subject to human errors.

New Method

The engineers designed a portable cart containing automatic recording apparatus, calibrated thermocouple probes, ice bath for accurate reference temperature control, built-in millivolt supply and storage facilities for probes, tools, etc. This cart is rolled to the furnace and plugged into an electric outlet. Probes are inserted in each of the probe holes in the furnace, and individual readings from each of twelve couples are automatically recorded by the instrument. No calculations are involved.

The true picture of heat distribution is made without disturbing production schedule.

Under the old plan, if a strip chart controller on a particular furnace needed a cleaning job, the furnace would be shut down. A technician would swing the instrument out on its hinges, disassemble it, clean it, and reassemble it on the spot in the atmosphere surrounding the furnace without full laboratory facilities.

The engineers devised methods of substituting calibrated spare instruments in place of those to be overhauled, and they designed and built laboratory testing facilities to functionally test the overhauled instruments to assure their proper operation before return to service.

Now, the controller can be unplugged and quickly removed from the instrument cabinet. In its place a pre-calibrated spare unit is installed within a few minutes. The technician then takes the field instrument to the laboratory where it is overhauled efficiently under controlled conditions of cleanliness, readily accessible spare parts stock and adequate test equipment.

Maintaining accurate control of heat treating equipment used by Lockheed's production department is no longer a cumbersome, time-consuming chore. Instead it is an economical, efficient and highly effective routine. Today, furnace instrument maintenance and certification is accomplished without affecting production schedules.

Pad-Mount Manufacturing Equipment

REMOVING manufacturing machines and associated equipment from production lines is time consuming and expensive. Since our manufacturing operation is basically classified as a "job-shop," i.e., products are made to customer specifications — each one different, the design and manufacturing operation of this product is continually changing. Our manufacturing equipment had to be installed so it could be rearranged quickly, reducing downtime.

To accomplish the desired flexibility in plant layout, we mount our machines and manufacturing equipment on rubber pads instead of bolting them to the floor as is frequently done in repetitive-type manufacturing operations.

These mounting pads keep the heavy equipment well in place and no machine shifting is experienced. With the equipment mounted on rubber pads and utilities such as power, water, and air flexibly hung from overhead drops, our equipment is almost mobile.

Prior to this arrangement, it required four men at least five hours to disconnect and reinstall one piece of equipment. Now, the same operation requires only two men for one-half hour — a considerable saving when "time is money!"

By H. E. MUNGAN, Manager-Plant Facilities, General Electric Co., Lynchburg, Virginia.

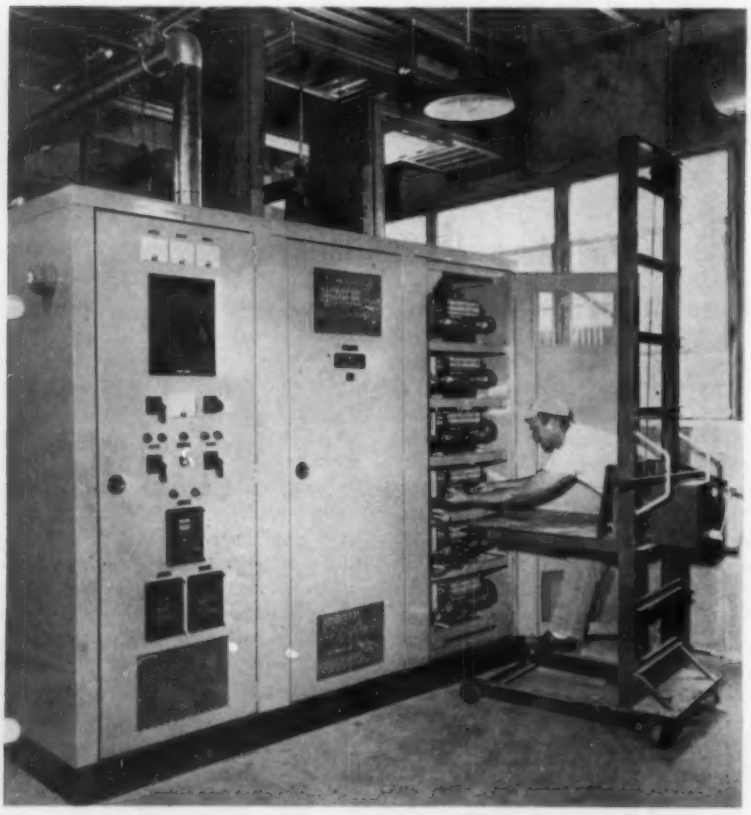
Germanium Rectifiers 96% Efficient at North Carolina Plant

By SAM BOYER
Foreman, Plant Facilities
General Electric Co., Hickory, N. C.

AN AMAZINGLY high efficiency of 96% is realized from a very compact installation of germanium power rectifiers at General Electric's new distribution transformer plant located near Hickory, North Carolina. The equipment occupies only 54 square feet of floor space and maintains a peak of 12,000 amps at 65 volts d-c to supply power for hydrogen-oxygen producing electrolytic cells.

A high capacity of 99.85% chemically pure hydrogen and 99.7% chemically pure oxygen is produced in the gas plant. This is obtained when 12,000 amps d-c is passed through twenty-two electrolytic cells connected in series with a voltage drop of 2.1 volts each. Purity of both gases is further improved during processing, by electrodrying to an equivalent of minus 100 F. Nearly 100% pure hydrogen is obtained by use of a Deoxo unit while compressing to high pressures.

Two rectifier sections and one coolant section comprise the rectifier assembly.



To produce the above cases, the d-c power supplied by the germanium rectifiers is passed through electrolyte contained in cells. This is accomplished by means of positive and negative electrodes and plates, thereby causing a dissociation of water molecules to produce free hydrogen and oxygen. Both gases are collected through separate piping and manifolds, prepurified and dried, then stored until used in factory processes.

This newcoming little giant in the power conversion field, the *germanium rectifier*, has within itself an efficiency of 98% at rated a-c input current versus d-c output current. Its application to the e'ectrochemical process within the Hickory Plant for producing gases has been most successful. Repeated tests, based on kilowatt input versus hydrogen-oxygen output, has been consistantly around 96% overall efficiency, including losses of transformer, controls and cooling system.

The germanium power rectifier installation, with associated equipment, includes a main high-voltage a-c circuit breaker; an outdoor three-phase liquid-filled rectifier transformer; an outdoor three-phase induction voltage regulator; a separate supply of low-voltage a-c power for rectifier auxiliary and control devices; direct-current measuring reactors; operator's control panel; and an indoor germanium power rectifier assembly, connected through disconnect switches and buss bar to twenty-two electrolytic cells.

The rectifier assembly consists of two rectifier sections and one

coolant section adjoined side by side. Each rectifier section contains six germanium power rectifier trays, which are shelved compactly one tray above the other in the cabinet.

The switching arrangement, mounted in the rear of each section, allows either rectifier section to be operated at rated voltage and up to 6000 amps, while the other section is in the "OFF" position. The switches consist of two each positive and negative disconnect, and a switch for polarizing-depolarizing the hydrogen-oxygen producing electrolytic cells.

The coolant section for the germanium power rectifier trays contains a motor-driven pump; a water-to-perchlorethylene heat exchanger; a perchlorethylene tank or reservoir; and suitably connected copper piping. Raw water is supplied to the heat exchanger through a temperature regulator valve, and cooling "perc" is recirculated through the heat exchanger and trays.

A thermoswitch in the "perc" return line opens at 41 C as a safety device to protect the germanium rectifiers in the trays in case of excessive temperatures due to cooling water supply failure or other causes. The temperature regulating valve is set to maintain the returning "perc" at 37 C or lower when operating at full load.

The operator's control panel is worthy of mention, as it contributes greatly to the successful operation of the rectifier unit by showing the operator at a glance the exact functional condition of any component of the rectifier assembly.

Located on the panel are the control switches for the induction voltage regulator, manual-automatic selector switch, voltmeter selector switch, voltmeter, circuit breaker control switches, ammeters for sections Number 1 and 2, totalizing ammeter, indicating lights, and an annunicator system to insure proper operation of the rectifier assembly.

The annunicator system has twelve drops, any one of which will sound an alarm when actuated. Its purpose is to notify the operator of the cause and specific location of any malfunction within the germanium power rectifier assembly.

Compactly engineered arrangement of electrolytic cells confines space requirements to 363 square feet. Service aisles between the two rows of eleven cells have been arranged with no lost space.

Connected to the annunciator, by means of a monitoring circuit, is the protective system. It employs auxiliary fuses to indicate blown power fuses in the busses feeding the germanium rectifier stacks. The term "stacks" refers to a series of germanium rectifiers or cells.

Upon operation of any one of the twelve power fuses protecting twenty-four germanium rectifiers in each tray, an associated auxiliary fuse will also operate. This will complete a circuit which will trip an annunciator drop, thereby indicating a fuse failure in either Section 1 or 2. Actually, failures of this type have been rare at the G-E Hickory Plant.

The annunciator system is also interconnected with various relays, and is supplied with a separate source of power other than the main power circuit to the rectifier. This permits indication of overloads, over temperatures, under water or under "perc" pressure, incorrect switch positioning, loose tray connectors, and other malfunctioning. It will also indicate improperly closed rear doors, which must be corrected before attempting to close the circuit breaker for starting the unit.

The high current capacity of the germanium power rectifier assembly has contributed to the compactly engineered arrangement of the high current density electrolyte cells. They occupy only 363 square feet of floor space in a separate room adjoining the rectifier room.

Service aisles between the two rows of eleven cells, and between the two rows of cells and four walls, have been arranged with no lost space. Size of the huge cell steel tanks are 48" long, 32" wide, and 55" high.

The high current requirements of the electrolytic cells are easily supplied by the assembly of tiny germanium rectifiers. They have a current density of several hundred amps per square inch, a low forward voltage drop coupled with low reverse current. This all results in high operating efficiency for the entire germanium power rectifier unit.

USE SPI READER SERVICE ON PAGE 65

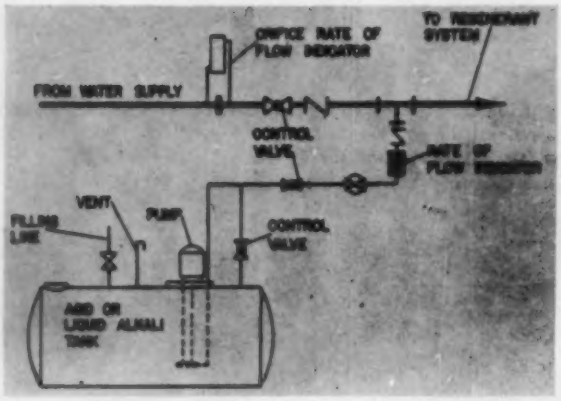


Figure 1

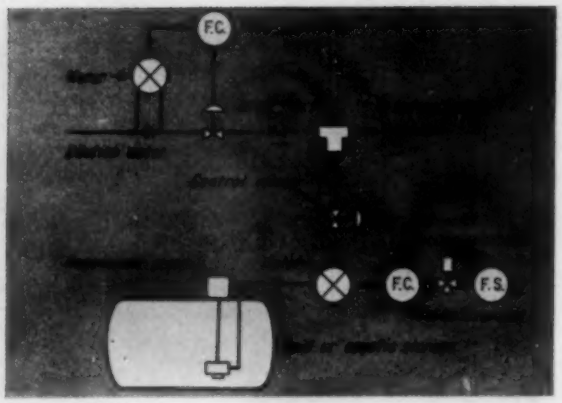


Figure 2

Instrumentation for Water Treatment Plants

Part 1 — Demineralization

CONTROL and instrumentation of demineralization equipment is covered in this first article of a 2-part presentation. Part II will consider control and instrumentation of cold process softening and clarification units and hot-process-hot zeolite and sodium zeolite treatment systems. It will also take up the use of panelboards and new and interesting instruments recently introduced.

By E. A. STRAHLENDORFF
Manager
Industrial Water Treatment
Grover Water Conditioning Co.

EARLY water treatment systems consisted largely of batch processes. Control was manual and instrumentation consisted at most of level gauges, thermometers and occasionally a flow meter. Over the past 30 years the amount of instrumentation and control equipment incorporated in water treatment plants has gradually increased. This increase was greatly speeded after 1945, mainly because of the widespread adoption of complicated ion exchange treatment systems.

The same amount of reliability had to be built into the ion exchange and other parts of the water treatment system as was built into the power station equipment. As boiler pressures have risen over the years from 250 lb up to 2,500 lb and even higher in supercritical plants, the need for the highest quality makeup water obtainable has become essential.

Systems to produce this water must operate in a reliable and reproducible manner. Moreover, there has been a need in all industries for cost reduction in operation and water treatment equipment because of the rise in labor costs over the years. This has led to an increased use of automatic operation.

Demineralization

The development of demineralization has provided the main area in the water treatment field for the application of instruments in general and automatic controls in particular.

Demineralization involves the removal of cations from water and their replacement with hydrogen ions and subsequently the removal of anions from the same water and their replacement with hydroxide ions. This results in a high purity water, with the degree of purity obtained depending upon the design of the system, the amount of chemicals utilized and, to some extent, the water composition.

Many types of demineralization systems have been designed in the last 10 to 15 years. Simplest of these is the two bed plant consisting of a single cation unit and a single anion unit. There are also the three bed system, the four bed system, a mixed bed unit, and a two bed plant followed by a mixed bed unit. Finally there is a three bed plant followed by a mixed bed plant.

The regeneration systems associated with these demineralizers become more complicated as the flow sheets of the individual plants become more complicated. The need for instrumentation and automatic control of these systems becomes almost a necessity as complicated designs are employed.

Instrumentation

In the modern demineralizer there are a number of quantities which must be monitored and controlled. One of these is the flow of water through the ion exchange

units. There are maximum rates in terms of gallons per minute per sq ft of cross sectional area that can be permitted through demineralizers if they are to produce high quality water. There are also maximum volumes of water which can be handled before exhaustion of the resin bed and breakthrough occur.

To control volume, totalizing meters of the displacement type or orifice meters operating through totalizers are included on the inlet to each ion exchange unit. Flow rates are maintained by controlling the pressure upstream from the demineralizer.

Introduction of regenerants to ion exchange units must be carefully controlled and should be monitored. On the earlier plants, ejector systems with measuring tanks were used. The quantity of acid or caustic was controlled by the volume of the tank from which it was being withdrawn. The rate of flow to the unit was controlled by a rate setting cock. Rate of flow of the dilution water was also controlled by rate setting cocks but with the addition of a rate of flow indicator on that stream.

Ejectors can be a troublesome item when handling chemicals such as acid and caustic and when passing acid waters such as are used in the displacement rinse of an anion exchanger. It is therefore advantageous, even at some increase in cost, to use pumps instead of ejectors.

On small plants the use of positive displacement proportioning pumps is a natural solution. With this type pump, quantity can be controlled simply by controlling pumping time. The pump itself takes care of rate of flow. On larger plants positive displacement pumps become excessively expensive and centrifugal pumps have to be used. There have been several systems utilized. They vary in their degree of automation and instrumentation.

Fig. 1 shows the simplest and least expensive control system where a centrifugal pump is used. The pump is vertical and mounted on a horizontal storage tank. Strong chemicals are pumped into a mixing tee where they are diluted with water — raw water for acid dilution and cation treated water for caustic dilution.

The controls on this system are simply rate setting cocks and a simple rate of flow indicator of the orifice type on the dilution water line. Pressure regulation upstream of this system is essential.

To improve the reliability and the reproducibility of the regeneration system, a system such as shown in Fig. 2 was developed. A rate of flow meter is included on the strong acid and caustic lines. Variable area type flow meters are often used since they are particularly good for this service since the flows are generally moderate, ranging between 2 and 15 gpm. This type meter is also available in corrosion resistant materials.

This metering system includes pneumatic flow rate controllers for both regenerant and dilution water flow. The dilution water flow rate is greater than the strong chemical flow and therefore an orifice meter can generally be used on the dilution line. This control system assures obtaining the proper strength chemical in the line leading to the ion exchange unit.

For two step introduction of acid into a cation unit, the flow controller has to include a flow control set. The pneumatic set flow controller receives two set point loading pressures as selected by solenoid pilot valves. These solenoids are energized at the proper moment by the automatic regeneration controls of the plant.

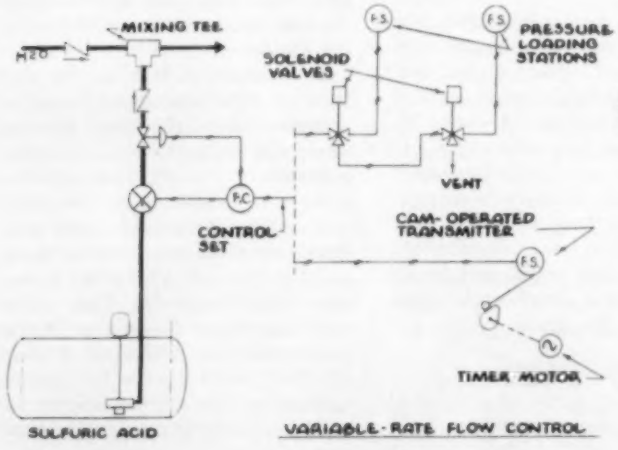
In the system shown in Fig. 2, volume is controlled only by time of addition; however, it is also possible to add flow totalizing to the strong chemical metering equipment to control more positively the volume of regenerant. This is a somewhat more expensive design.

Stepless Regeneration

A final refinement of acid flow control is a stepless regenerant introduction system. This is often used for sulphuric acid regenerated cation units. The system in Fig. 3 very closely resembles the one just shown, except here a cam operated pneumatic transmitter feeds a set point signal to the flow controller, thus giving the exact strength of acid wanted.

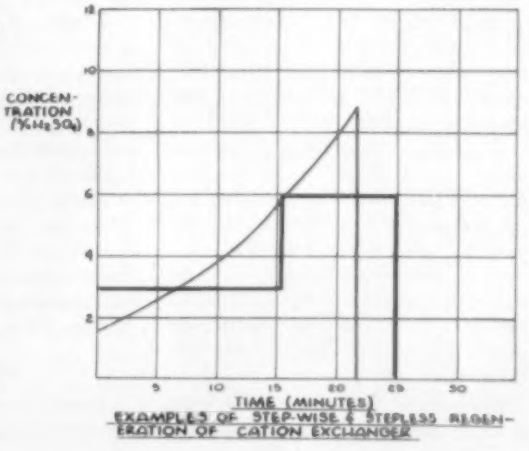
You can see from the graph in Fig. 4 that the acid concentration will rise gradually to a maximum somewhere between 8 and 10 per cent. In a stepwise system the low concentration between 2 and 3 per cent will last for approximately 15 minutes, although generally it is

Figure 3



VARIABLE-RATE FLOW CONTROL

Figure 4



EXAMPLES OF STEP-WISE & STEPLESS REGENERATION OF CATION EXCHANGER

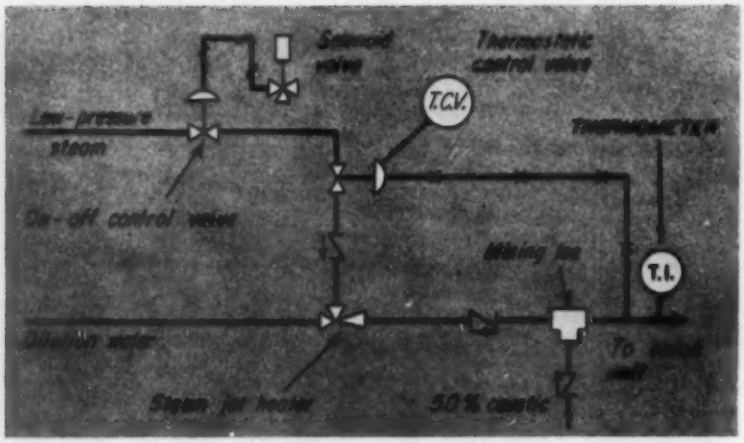


Figure 5

for a shorter period of time, and the high concentration around 6 per cent can last for another ten minutes.

With the stepless system total regeneration time is shorter and more efficient and better quality is obtained out of the exchanger. Incidentally, the cam which is driven by a synchronous motor timer can be cut to any shape to give any type of curve desired for controlling the rate of increase in acid strength.

The need to heat caustic for use in regeneration of strong base silica removing anion exchange resins poses control problems. Several systems have been developed, the simplest of which is shown in Fig. 5. In this case steam is used as a source of heat. (It is generally the most popular source, but if steam is not available an electrical heating system must be used.)

In the steam system, the steam can be mixed directly with dilution water in a jet-type instantaneous heater. The steam admission is controlled by an on-off control valve (assuming that the steam is from a constant low pressure source).

A simple thermostatic control valve is placed on the steam line for this purpose. It is actuated by the temperature of the blended regenerant downstream of the mixing tee. These temperature control valves are generally of the direct-acting type; however, on larger plants pneumatic instruments are often used instead.

An indicating thermometer with a high temperature contact is installed downstream of the mixing tee to provide a final check on the system. This check is important because the anion resin is temperature sensitive and strong base anion resin will be seriously damaged or ruined if exposed to temperatures much in excess of 120-140 F.

Quality Control

Records should be kept of demineralization plant performance. These records should include total flow of water to the demineralization plant which means including a totalizing and recording meter on the inlet header to the system. The flow of water to each ion exchange unit should preferably be recorded as well as totalized. The flow of regenerant to each ion exchange unit on the more modern plants will be recorded as well as totalized and indicated. Sometimes the flow of dilution water to the acid and caustic mixing tees will also be recorded.

It should be noted that the amount of water required for backwash and rinse of ion exchange units is included in the record of total flow of water to each exchange unit, therefore another record that is sometimes kept is the net flow of water to service. This can be done either by installing a flow meter on the effluent from each anion unit or by installing such a meter on the main header from the plant.

Conductivity

Conductivity is the main quality control indicator in the demineralization plant. One ppm of leakage from a strong base silica removing plant (NaOH) is equal to five micromohos conductivity. In a weak base plant, 1 ppm equals 2.2 micromohos. Leakage in this case is sodium carbonate.

Four bed plants almost always produce water with a quality of one million ohms or better and mixed bed plants or two bed-mixed bed scavenging plants produce qualities ranging between one and five million ohms or more. Therefore, total solids desired are at extremely minute values and no ordinary chemical laboratory analysis will provide much useful information. Reliable conductivity instruments are a must.

A conductivity cell is always installed on the effluent line from each anion unit. This cell will activate the conductivity indicator and in many cases a recorder as well as an alarm device. The conductivity instrument is in essence a Wheatstone Bridge with a tuning eye tube as a null point indicator. The instruments include temperature compensators.

Cation effluent conductivity can be used as a good indication of cation breakthrough and naturally whenever a cation breakthrough occurs, an anion breakthrough also occurs. Very often poor effluent thought to be caused by the anion unit is pinned down to the cation unit by carefully checking conductivity values from that unit.

Indication of cation breakthrough today is generally done by means of a differential conductivity indicator. With this device (Fig. 6), samples of water are taken at two points in the ion exchange resin bed; one point at the top of the bed, and another point toward the bottom of the bed.

The theory is that as the bed becomes exhausted, the exhaustion proceeds down the resin fill and when the resin at the upper point has begun to be exhausted a sample of water from the point will exhibit a sharply lower conductivity than one from a lower point in the bed. This gives a conductivity differential. The instrument again is a Wheatstone Bridge measuring the difference in conductivity between the two points.

Another way of monitoring cation unit performance, where there

is a large battery of cation units, is to compare the conductivity produced by one unit against the conductivity produced by the entire battery. If a differential is obtained between an individual unit and the battery it indicates that unit is at or near exhaustion.

Another use for conductivity is as an indication of regenerant strength, both acid and caustic. Conductivity instruments can be tied into automatic flow controllers if desired, although this is generally not done.

pH Control

Conductivity is more important than pH in quality control, but a pH indicator can be a useful tool. When installed on the effluent from an anion unit, a pH indicator in combination with a conductivity recorder can give a very good indication of breakthrough.

At breakthrough the conductivity from the demineralizer will drop as the type of leakage changes from a hydroxide leakage to a salt leakage. At the same time the pH will fall when these two conditions occur. Sometimes it is difficult to tell this with only a conductivity instrument. In addition to this a pH meter (generally a recorder) is often installed on the effluent line from the demineralizer to protect against the possibility of low pH water.

Automatic Regeneration

With the introduction of ever more complicated demineralization plants, valving becomes extremely complicated and the regeneration procedures also become more complicated. The degree of complication has been such that virtually every modern demineralizer installed in a central station utility and most large industrial plants are designed for what is called automatic operation.

Automatic regeneration can be accomplished either by controlling a nest of air, hydraulic or motor-operated individual valves, or by means of motorized multiport valves. With individual valve systems, the individual valves are generally air-operated, rubber-lined Saunders Patent diaphragm valves.

The opening and closing of these valves in proper sequence is governed by a sequence cycle controller which can be designed to govern as many as 12 different operations. The controller has the advantage that the punched time disk that operates the cams inside the mechanism can be changed at will to provide changes in the timing of the various regeneration steps.

The valve system has the advantage of being completely leakproof which will assure high purity water. The control element and the valve elements are comprised of standard type items which are familiar to most industries and utilities. Parts are readily stocked and no special or expensive parts are required. Its main disadvantage is that it is somewhat more expensive than multiport valve systems of comparable capacity. It should be noted that individual valve systems generally include one timer for each unit. For economy, however, they can be designed to include one timer for an entire battery of units or one timer for every paired cation and anion set.

Multiport Valve

A multiport valve combines the operation of an individual valve nest in one housing. In some cases it operates by means of a rotary disc sliding over various ports or in other cases by individual double-ended pistons or diaphragms opening and closing to admit water to and from the various ports. It utilizes an internal construction which features four double-ended sliding pistons.

When designed for automatic operation the control of this multiport valve would be by means of motor operation of a rotary disc pilot valve acting as a hydraulic pilot for the main control valve. The positioning of multiport valves is motor actuated; the scheduling of the regeneration sequence is governed by a program timer.

The main advantage of multiport valve controls is that the timer controls are less complex and less expensive than the individual valve control systems. They do not require air tubing or hydraulic tubing as do individual valve systems. The program timers are generally mounted right by the units and not on central panels. This can provide quite an economy

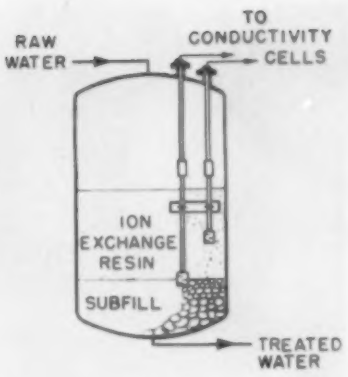


Figure 6

in the design of a panel.

The sequential timers of individual valve systems can also be mounted at the units but generally they are located on the main panel. Multiport valves themselves are cheaper than a nest of individual diaphragm valves; also the piping running from a multiport valve to an ion exchange unit is simpler and less expensive than that required for a valve nest since it contains fewer fittings.

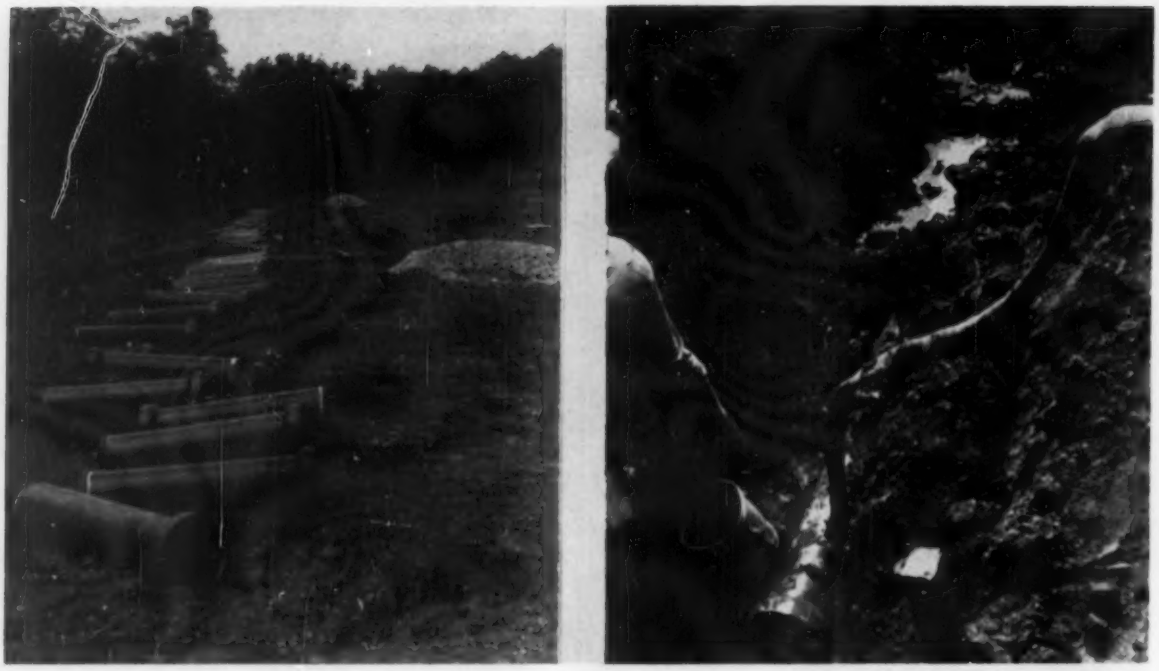
A disadvantage of multiport systems is that the valves and controls are specially designed for each other. The components are usually not familiar to the utility or industrial power plant engineer and therefore require stocking which is generally fairly expensive. Delivery problems in securing these parts have sometimes caused problems. In other words, maintenance is more of a problem with this system.

The rotary disc design valves are generally not considered completely leakproof. Therefore it is risky to use them on systems designed to produce ultimate purity water. The diaphragm type multiport valves are sometimes subject to diaphragm rupture.

Piston Operated Valve

The piston operated valves seem to be the best solution to a single valve control system. It should be pointed out that no multiport valve system is really readily adaptable to mixed bed unit control because the number of steps on a mixed bed would require the inclusion of at least two multiport valves per

(*Continued on Page* 37)



The view at left shows Plastisol joints laid out for job at Salem, Virginia. The water problem is clearly evident in picture at right.

Plastisol Clay Pipe Joints Come of Age

By DAVE W. SEWELL
Chief Engineer
Pomona Terra Cotta Co.
Greensboro, N. C.

THE PHOTOGRAPH above shows sewer pipe being installed under conditions which only a few years ago would have made the job almost impossible. But new materials and methods in regular use today make the job easy.

Difficulty in the past has been the method of joining the pipe sections to form a line. In the old method, jute or oakum is tamped into the annular space between the bell and spigot of the pipe. As the jute is tamped, it tends to center the joint and serves as a gasket for sealing compound. These compounds must be heated, thus the name "hot poured joint" was derived. Obviously, making up such joints in the mud is practically impossible.

The new joint consists of a factory molded ring of polyvinyl chloride vulcanized to both bell and spigot ends of a sewer pipe. The contours of that portion of the ring formed by the mold are of such design that they form a cooperating joint by inter-locking two raised, half-moon-like areas, one on the spigot and one on the bell.

The OD of the spigot ring is slightly larger than the ID of the bell which results in a slight amount of interference. The compression force resulting from this interference coupled with the inter-locking ball feature results in a water and root proof joint.

Experiments have proved this joint water proof under a hydraulic head of 25 feet. Root penetration test of eight years duration reveals no penetration. Polyvinyl chloride itself is very resistant to attack by salts and acids commonly found in sewerage.

Examples

More than 60,000 feet of this pipe was used on one project in Florida in an application where many joints were made under water. This job could not have been completed with reasonable cost otherwise because of the water problem. Domestic and industrial sewerage are handled by the lines. 190,000 feet of Plastisol jointed pipe were used at Venice, Florida. 200,000 feet of Plastisol joint pipe were used in the municipality of Vero Beach, Florida. The City of Salem, Virginia had a moist soil problem which was also solved with Plastisol jointed pipe (see illustration).

Procedure

The actual laying of a line is quite simple. A ditch only wide

enough to permit movement of workers or to accept the pipe is all that is necessary.

Sewerage lines are always layed bell up-stream. The bell from the previous pipe length is coated with a solvent or lubricant furnished by the pipe supplier. The spigot ring is similarly coated. The spigot end of the loose joint is aligned with the bell of the previous joint and a slight amount of actual force is applied against the line in a down stream direction. The joint slips into place; actually one can feel the locking action. Then the new length is aligned and brought to grade.

The speed at which a contractor can lay pipe is now controlled principally by his ability to open his ditch to grade; the laying crew will be "pushing" the ditching machine. The Plastisol joint is flexible enough to allow for normal earth movement without rupture.

Closeup of bell and spigot ends showing Plastisol joint.

Manufacturing

The actual manufacturing process of the joint is similar to rubber vulcanizing. The areas of the bell and spigot which contact the polyvinyl are first coated with an adhesive primer. The viscosity of the primer is about that of shellac. When cured it serves as a bonding agent between the vinyl and pipe surface. Next the bell and spigot molds are attached to the pipe. As the molds are placed, they are lubricated with a silicon mold release.

In most operations the pipe is suspended vertically from a monorail conveyor. This enables the operator to place and center the bell mold in the bell and another operator to attach the spigot mold to the spigot. The spigot mold is held to the pipe by a chain and spring device attached to the bell mold, the chain passing down through the pipe barrel.

From the mold station the pipe passes to a 300-degree preheater. The object of preheating is to set the adhesive and to heat the pipe and molds. From the preheater the pipe travels to a fill station where both bell and spigot molds are filled with polyvinyl. When the liquid polyvinyl strikes the hot surfaces of the mold or pipe it quickly jells, preventing leakage.

Next in line the pipe passes through a 325-degree cure oven in which the vinyl is cured. When clear of the cure oven and molds are stripped from the pipe, it is inspected and packaged for shipment.

The Plastisol joint has made it possible to lay a completely acceptable sewer line in wet conditions heretofore impossible with the hot poured joint. And also, it has enabled contractors to reduce their labor cost.

Instrumentation for Demineralization

(Continued from Page 35)

unit and this is extremely cumbersome.

Initiation of demineralizer regeneration cycles can be either on a fully automatic basis determined by total gallonage delivered by a unit or by production of a high conductivity water. Alternately the regeneration can be manually initiated by means of a push-button. It is generally considered more desirable to have regeneration push-button initiated since this assures that the operator at least occasionally will have to give some attention to the system and its instrumentation.

When the operator starts a regeneration he will observe the performance of the unit during the initial stages of that regeneration. Then when the regeneration is finished, an alarm sounds and the operator must push a button to put the unit back on the line. He will observe the initial conductivity to make sure that the regeneration had proceeded properly and accomplished its purpose.

It should be emphasized, however, that although it is wise to require minimum attention by designing for push-button automatic operation, fully automatic plants are perfectly practical and have been put into many industrial plants and utilities. The difference in price between fully automatic and push-button automatic systems is practically negligible.

Editor's Note:

The next and final article of this series on instrumentation for water treatment plants will appear in the December issue.

KEEP-UP-TO-DATE
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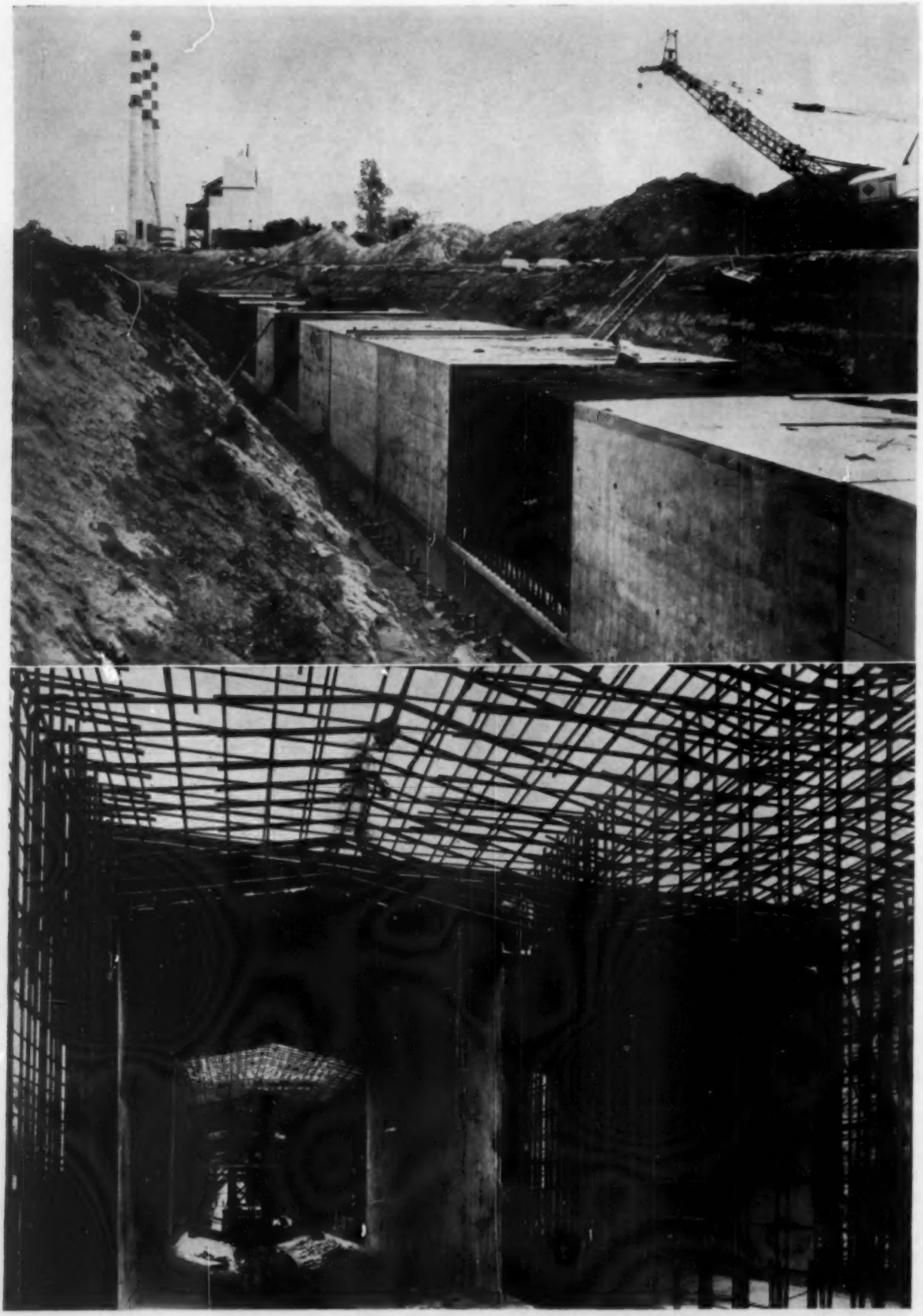
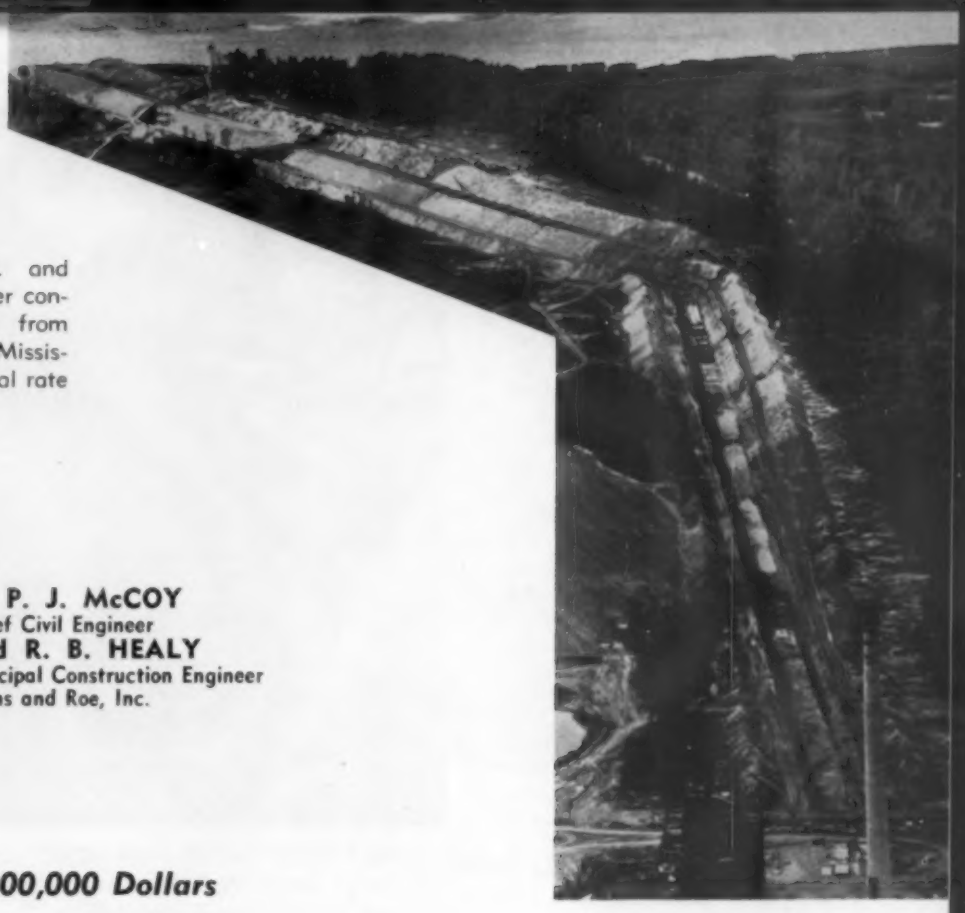
See Page 65





DISCHARGE TUNNEL and open canal (shown under construction) carry water from plants' condensers to Mississippi River at an eventual rate of 750,000 gpm.

By P. J. McCOY
Chief Civil Engineer
and R. B. HEALY
Principal Construction Engineer
Burns and Roe, Inc.

Memphis Saves 1,000,000 Dollars

Nickel-Copper Expansion Joints Eliminate Need for Piling

EXPANSION JOINTS, made of Monel nickel-copper alloy, saved approximately one million dollars at one of the world's largest municipal power plants. These joints gave flexibility to the discharge tunnel and eliminated the need for a piling foundation under the line at the new Thos. H. Allen Electric Generating Station, Memphis, Tennessee.

PARTIALLY COMPLETED discharge tunnel contains Monel alloy expansion joints (spaced about 50 ft apart) to give flexibility. Tunnel is located on land which may be filled in whole or in part at some future time for industrial development.

This 4,000-ft long discharge tunnel is a part of the $121 million generating station designed by Burns and Roe, Inc., well-known New York consulting engineers. They are also supervising its construction for the City of Memphis. This station is the largest steam power plant ever authorized at one time by any municipality in the world.

A full siphon effect must be maintained in the two 13-ft square tunnels, in order to avoid a possible additional annual pumping charge at certain times of the year. (Both tunnel outlets will eventually handle approximately 750,000 gpm).

Leaking through concrete cracks or poor joints had to be prevented, so the installation of piling was considered to eliminate cracking that might result from uneven settlement of the tunnel at different locations. Expected future industrial development in the area could aggravate this condition.

In order to save the estimated $1,000,000 cost of such a foundation, an alternate design of an articulated (or jointed) type tunnel was selected. This design em-

ploys Monel alloy as the waterstop material at flexible joints, spaced about 50 ft apart, to provide durability, pressure tightness, and flexibility under any possible conditions of opening and closing of the joints. A number of other expansion materials were considered, but Monel alloy was selected because it best fulfilled all of the requirements. Approximately 10,000 lb of Monel alloy have been installed on this project.

The contractor furnished Monel alloy which is approximately 2/3 nickel and 1/3 copper and met the requirements of the specification for corrosion resistance and strength over the many years which the tunnel will be in use.

The expansion joint material is Monel nickel-copper alloy, hot rolled, annealed and pickled, roofing quality sheet in accordance with ASTM Designation B-127-58T "Nickel-Copper Alloy; Plate, Sheet and Strip." The Federal Specification for equivalent material is MIL-N-894C (Navy) or QQ-N-28/a. The material is 25 gauge U. S. Standard, 0.021 in., 16-oz per sq ft. Width of the expansion joints was prefabricated to fit the contour of the joints and then bent in accordance with detailed drawings.

The expansion joints are approximately 15 in. wide, formed with a U-shaped section at the center and with the edges bent with a minimum radius of ⅛ in. It was required that the material in the expansion joints be furnished in the maximum available lengths, to minimize soldering and riveting. All joints were pretinned and lapped at least 1 in., riveted with 4 Monel rivets and soldered, to make them continuous and watertight. The solder contained a minimum of 50% tin and the remainder lead. The "U" is packed with a pre-molded sheet filler and the joint is beveled ⅛ in. and finished with joint-sealer.

PORTION OF EXPANSION JOINT embedded in floor of discharge tunnel. Approximately 10,000 lb of Monel alloy were used on this tunnel construction.

Expansion joints were prefabricated by Ben. J. Malone Co., Sheet Metal & Roofing Contractors, Memphis, Tenn.

When the plant is completed, it will have three turbine-generator units with a total nameplate rating of 750,000 kw and a gross capacity of 862,500 kw. Steam will be supplied by three individual 2,000,000-lb per hr boilers with seven cyclone furnaces for each, fed by one of the nation's largest coal-handling systems. A detailed description of the entire plant is scheduled for a coming issue of SPI.

Because of lack of rock or bed foundation, over 7,000 piles were driven to average depth of 60 ft to help support the plant's tremendous weight. The station's smoke stacks will rise approximately 400 ft into the air; it will take six large pumps to deliver 381,000 gpm of circulating (cooling) water to the condensers.

The first unit began operation in late 1958. The second and third units will be completed early in 1959.

Spare the Insulation

WE HAVE SOME heavy lifting magnets that are carried around the plant on a walking crane to pick up and load scrap. The magnets are plugged in at any d-c outlet convenient to the crane's location, and a hand-operated knife switch is used to flip the juice on each time the crane operator drops the magnet atop some scrap.

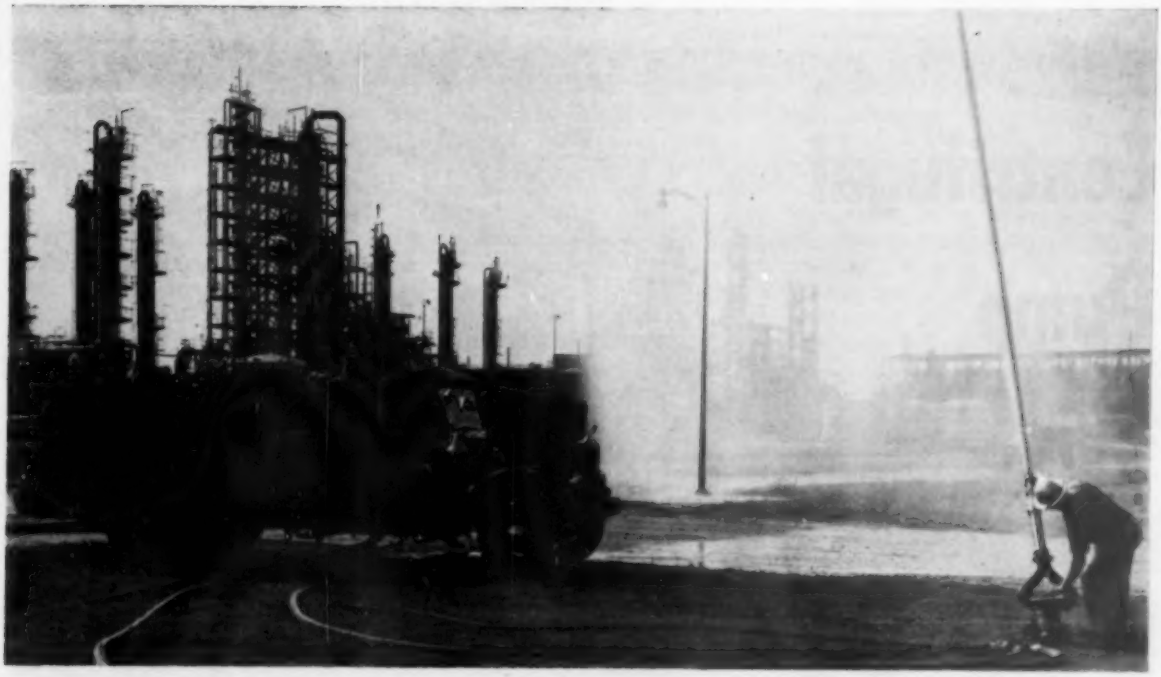
The switch is pulled out when the magnet and its load are poised above a gondola.

Each time the switch is opened, the collapsing magnetic field in the magnet boosts up to a high voltage that could damage the windings.

This was cured by connecting resistors across the terminals of the switch. The resistors draw very little current, and when the switch is turned to the ON position, current by-passes the resistors and energizes the magnet.

When the switch is pulled off, the induced EMF dies out through the resistors, sparing the magnet windings.

By H. J. MILLER
Sarasota, Fla.



New Orleans, Louisiana . . .

FIRE HOSE for Tough Service

THE BIG Fortier chemical plant of American Cyanamid near New Orleans is replacing all its cotton hose on a wear-out basis with single-jacketed hose of Dacron impregnated with, and over, a core of neoprene. Decision was based on greater dependability, superior performance, and potentially longer life of the hose, demonstrated during the past four years' use.

In 1954, 1,000 ft of hose of "Dacron" was purchased from the Quaker Rubber Division of H. K. Porter, Inc., on an experimental basis to replace double-jacketed cotton hose. Unique properties of "Dacron" — its resistance to chemicals and toxic fumes, and freedom from damage by mildew — were considered by Safety Supervisor M. L. Tackney and Fire Chief L. M. Byrd to offer important advantages to this chemical processing plant.

Fire is an ever-present hazard where daily operations involve handling acetylene, hydrogen cyanide, acrylonitrile, ammonia, monomethyl styrene, toluene, oxygen, and hydrogen. "Dependability" is regarded as first requisite for fire-fighting equipment, which includes 25 hydrant-hose houses and 12 hydrant-foam houses, located throughout widely spread manufacturing facilities. The foam houses are ready for immediate action against fires which can't be controlled by water alone.

Hose houses each have 250 ft of 2½-in. hose and 200 ft of 1½-in. hose connected to hydrants in "ready" positions. Hose of "Dacron" polyester fiber is in use in both hydrant-hose and hydrant-foam houses.

The fact that the plant operates its own full-fledged fire truck — equipped with 2,000 ft of hose ready for instant fire fighting — underscores its big size. Some of the truck's hose is 2½-in. single-jacketed hose of "Dacron."

From the standpoint of cost-performance, Plant Fire Chief L. M. Byrd believes that ultimately the new hose may prove less expensive than double-jacketed all-cotton hose. While initial cost of "Dacron" is higher than cotton, plant management considers its dependability, superior performance, and potentially much longer life justify the increase.

Centrifugal Pump Clinic

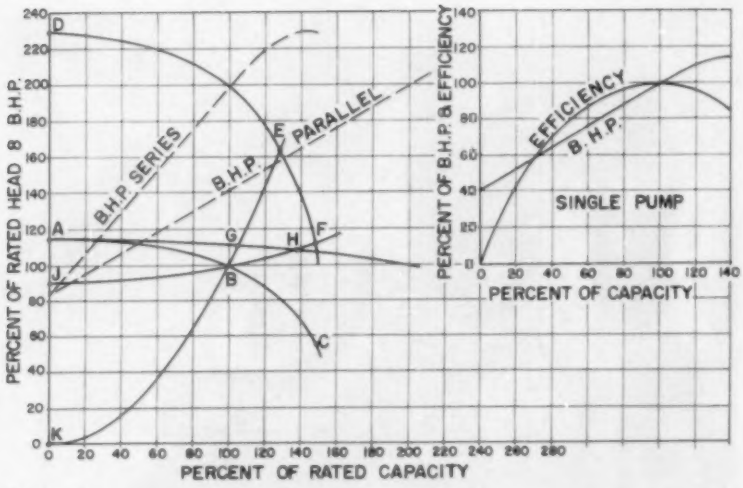


Fig. 1

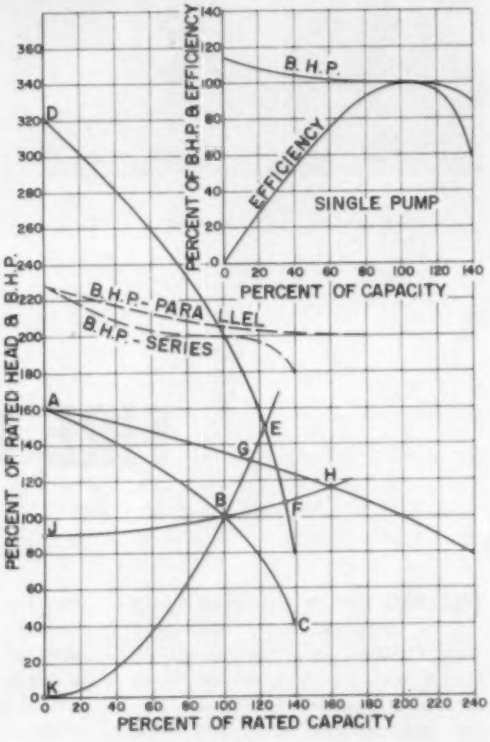


Fig. 2

QUESTIONS & ANSWERS — Conducted for SPI readers by **Igor J. Karassik**, consulting engineer and manager of planning and **W. C. Krutzsch**, assistant Chief Engineer of the Harrison Division, Worthington Corporation.

QUESTION 1—Parallel or Series?

WHEN TWO PUMPS are installed to take advantage of one and two-pump operation for a varying capacity demand, is it preferable to use the two pumps in parallel or in series if a greater range in capacity is desired between single and two-pump operation?

ANSWER:

THIS WILL DEPEND upon the shape of the system-head curve as well as, to some extent, on the shape of the pump head-capacity curve. The system-head curve is constructed by adding the friction losses at all capacities to the static head that will prevail. The capacity that will be delivered into the system will correspond to the intersection of the system-head curve with the head-capacity of the pump or pumps used in the system.

To construct the head-capacity curve of two pumps in parallel, it is necessary to add the capacities of the individual pumps for various total heads. Contrariwise, the head - capacity of two pumps in series is constructed by adding the individual pump heads for various capacities.

If the static component represents a large portion of the system-head and the friction losses are low, parallel operation is preferable. On the other hand, if the system-head is composed almost entirely of friction, operating the two pumps in series will give more flow through the system than if the pumps operate in parallel.

To illustrate this general statement, let us consider a few examples showing rather extreme characteristics for both pumps and systems. For this purpose we have prepared illustrations showing all variables in terms of per cent of rated values. This facilitates comparisons and provides general solutions. This will avoid any possible connotations of particular pump sizes or types.

Fig. 1 represents a type of pump having a flat head-capacity curve (A-B-C) and shows in addition the combined head-capacity curves of two pumps in series (curve D-E-F) and of two pumps in parallel (curve A-G-H). Super-

imposed on the pump curves are a flat system-head curve (J-B-H-F) consisting primarily of static head, and a steep system-head curve (K-B-G-E) composed entirely of line friction.

For a system composed entirely of friction, it is immediately evident that two pumps in parallel would operate at point G and would provide only 105% of the capacity obtained with a single pump. The same two pumps in series, however, would operate at point E and provide 128% of single pump capacity.

Thus, in this instance, there is an obvious advantage in series operation. The particular circumstances used in this example are quite typical of pipeline service.

Considering the same pumps applied to the flat system-head curve, two pumps operating in series at point F still show a slight advantage in capacity over parallel operation at point H. But against this slight advantage, we must weigh the following disadvantages:

1. Brake - horsepower, which has been indicated by dotted lines on Fig. 1, would total 230% of the rated horsepower for one pump. For this power input we would obtain 148% of single pump capacity, indicating a power-capacity ratio of 1.55. With parallel operation, the brake-horsepower is 164% and capacity is 138%, yielding a power-capacity ratio of 1.19. Thus there is a decided disadvantage to series operation in terms of cost per gallon of liquid pumped.
2. With pumps operating in series, the stuffing box pressures of the second stage pump will be increased by an amount equal to the total head developed by the first stage pump, unless special features are incorporated in the pump to alleviate this condition. These special features add to the initial pump cost, while on the other hand their absence may lead to increased maintenance cost for packing and shaft sleeve replacement. This disadvantage exists for series operation under any circumstances, but in the case of a steep system-head curve they might be accommodated in return for more improvement in capacity.
3. With two pumps in series operating at point F, each pump must handle 148% of normal capacity. This may well result in a serious NPSH problem at the first stage pump, since the required NPSH increases very rapidly beyond the design capacity of 100%. For parallel operation at point H, each pump would handle only 69% of normal capacity and the problem of NPSH is eliminated.
4. If the pump driver had been selected without any margin over the power requirement at rated capacity, operating at point F will overload the driver.

Considering the same system-head curves but a type of pump having a steep head-capacity curve, the picture (as shown on Fig. 2) changes radically. The identification of the curves and of the operating points corresponds to that given on Fig. 1.

In this case, the capacity advantage of series operation on the steep system-head curve is greatly diminished compared to the previous illustration. Here, series operation yields only 122% of single pump capacity compared to 115% for parallel operation. Unlike the previous case, however, the total power consumption is actually less for the greater capacity obtained from series operation than it would be for the smaller capacity which would be realized by parallel operation. This is caused by the fact that the power consumption curve of such pump types actually diminishes instead of increasing as capacity increases.

On a flat system-head curve, however, operating this type of pump in parallel would show a definite advantage over series operation, yielding 160% of single pump capacity as against 134% respectively. This is indicated by comparison of points H and F on Fig. 2.

While these illustrations have been selected to substantiate the general statement made in the first paragraph of our answer, the figures and discussion provided should be adequate to permit the construction of a similar set of curves for any specific installation.

QUESTION 2—Are Baseplates Needed?

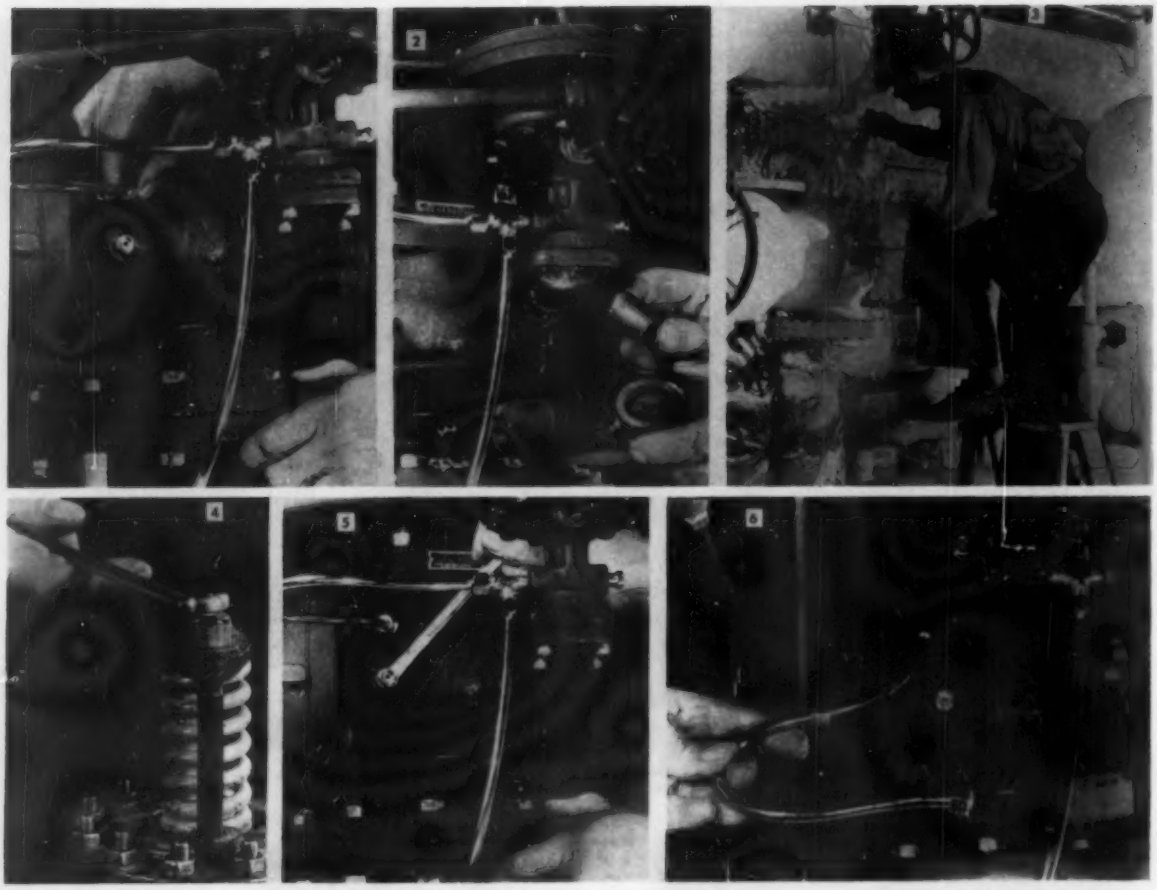
CENTRIFUGAL pumps are always quoted with structural steel or cast iron baseplates under the pump and the driver. Is this really necessary and would there not be a substantial saving in omitting the baseplates, mounting pump and driver on soleplates embedded in concrete?

ANSWER:

A BASEPLATE may cost from 5 to 10% of the price of the pump, but its elimination would save only part of this cost since it would be necessary to provide machined surfaces such as soleplates, to align these soleplates with considerable care and to fasten them to the foundation. The ultimate saving, therefore, may not be too significant.

On the other hand, baseplates provide a number of advantages which cannot be obtained with soleplates. While the primary function of a baseplate is to furnish machined mounting surfaces for the pump and its driver, it also acts to collect any drips or drains which would otherwise spill right on the floor. In cases where a complex lubricating system is used, involving separately driven oil pumps, oil coolers, filters, etc., they can be more readily and practically mounted on the baseplate.

Of course, as the size and weight of a unit is increased, the cost of the baseplate may exceed by a very considerable amount the cost of the field work necessary to align either individual baseplates or soleplates under pump and driver. Therefore, in the case of extremely large units, it may be economical to omit the baseplate, unless the desire for improved appearance or the need to utilize the base to collect drips or to mount auxiliary equipment justifies the additional cost.



Six Easy Steps to Regulating Valve Maintenance

1. **NEW REGULATORS** should be checked after first few days on job. Look for dirt at orifices of external pilot type by uncoupling outlet tubing of main valve and unscrewing (in some cases) restriction orifice of main valve (Fig. 1).

2. **CHECK INLET** screen of internal or external pilot after first few days if provided. Removing four bolts exposes strainer on regulator shown here (Fig. 2).

3. **QUICK RECHECK,** if newly installed regulator does not work, includes tracing control piping to see if it is tight and connected correctly (Fig. 3); checking for sufficient steam pressure in main line; and comparing valve and pilot with specifications. Bypass should be closed, stop valves open.

4. **ADJUST SPRING** on pilot so that compression opens pilot to let steam flow to open main valve. Air loading in place of spring is easier to adjust since it is normally gaged and can be controlled remotely (Fig. 4).

5. **REPLACE ORIFICE** if missing from pilot connections (Fig. 5); clean if clogged — when regulator does not open or pressure sags. Snubbing orifice and tube should be cleaned if valve still does not function.

6. **TEST PILOT** for clogging by removing bleed port bend, cracking open inlet stop valve (or similar check on other external pilot types). If no steam flow, clean inlet screen. Check ¼" pipe connections to pilot and main line strainer for plugging. Disconnect control line and blow through to clear (Fig. 6).

MAJOR SOURCES of trouble for both internal and external piloted regulating valves are dirt and human error in adjustment. Kept free of dirt, regulators usually function for years with a minimum of attention.

Human errors are relatively easy to find and correct by following a few simple steps. Traps and other accessories should be checked at the same time. "Hunting" or erratic control results from: partially obstructed bleed port (clean out); oversized regulator with large pressure drops or very light loads (change bleed port opening); sticking or binding of pilot or main valve (clean stems, guiding surfaces); and leakage through water pockets at low delivery pressures (drain control pipe).

Basic steps and maintenance checkpoints for both types of regulators are illustrated in the accompanying six photographs showing how to trouble-shoot an externally-piloted regulating valve manufactured by Spence Engineering Company, Inc.

Ultrasonic Cleaning Saves Time and Money

UNION ELECTRIC Company, St. Louis, Mo., uses ultrasonic equipment to make meters look and operate almost as good as new. An ultrasonic generator and tank transducer remove even the most stubborn service grime in only a few minutes. And, in reconditioning the instruments, Union Electric saves many steps: complete disassembly, hand-brushing, several rinses, and reassembly.

Meter parts, such as threaded line jumper connectors, instrument clock units, and demand registers are racked for easy handling. In addition to meters, Union Electric ultrasonically cleans totalizing relay parts, watches and instrument frames.

Racked parts are simply immersed in detergent and hand-agitated to aid soil removal. The cleaning cycle consists of three stages:

1. Ultrasonic wash in detergent solution for 1 to 5 minutes, depending on accumulation and type of soil.

2. Ultrasonic rinse in neutralizer for ½ to 1 minute, to eliminate carryover from the first stage. A switch in the generator circuit permits the output to be shifted easily from one tank to the other.

3. Soak in Dow Chlorothene, to aid drying. (No ultrasonic energy in this phase.)

Meters need be only partially disassembled. Millions of tiny "scrub brushes," created by the action of sound waves on the liquid, reach into blind holes, threaded sections, and undercuts to dislodge all contaminants. A time clock switches on the power to warm up the generator 15 minutes before starting time, and turns it off at the end of the day's run.

The equipment used by Union Electric is a Sonogen generator and two tank transducer combinations manufactured by Branson Ultrasonic Corp. High frequency (38 kc) electrical energy of the generator is converted by the transducer into mechanical vibrations of the same frequency. These are transmitted through the stainless steel tank, against which the transducer is mounted, into the detergent solution.

The remarkable cleaning ability of an ultrasonically activated liquid is due to a phenomenon called cavitation, a repeated build-up and release of thousands of voids in the fluid. This action is so powerful that soot, oil, grease, sludge, and even rust are literally blasted off any object suspended in the cleaning medium. Only a faint crackling and the appearance of whitish "spiders" in the liquid give any indication of the tremendous forces being generated.

Union Electric Company's experience with old though serviceable meters shows that cleaning and reconditioning are economically sound — when ultrasound does the job.

After first ultrasonic wash in detergent, parts are ultrasonically neutralized, then finally soaked in trichlorethylene to speed drying.

Questions and Answers about EQUIPMENT LEASING

By ROBERT SHERIDAN
President
Nationwide Leasing Company

THE FOLLOWING article describes equipment leasing and enumerates its advantages. This, like all other methods of financing, requires careful study and analysis for each application considered. Readers of SPI are invited to comment on experience with equipment leasing in their own plants.

1. **What is the volume of equipment leasing by Southern industry?**

At the end of 1958 there was approximately $21 million worth of production equipment on long-term lease in Southern industry as a whole. Of this, somewhat under 5 per cent was leased by power plants, though a much larger proportion was involved in equipment relating to power.

Equipment on lease to Southern industry included boilers, generators, materials handling equipment of all types, refrigeration and air conditioning equipment and systems, all types of power-driven machinery, controls equipment, and data processing machines.

Major reasons for the growth of equipment leasing are:

(1) The steadily increasing cost of equipment.

(2) The increasing tightness of working capital.

(3) Unrealistic government depreciation schedules.

Some Southern equipment manufacturers have begun to use leasing as a sales tool. Through leasing they are able to offer their customers 100 per cent financing, while receiving from the leasing company 100 per cent cash on the barrelhead for the equipment.

2. **What is the volume of equipment leasing by U. S. industry?**

At the end of 1958 there was approximately $227 million worth of production equipment on long-term lease throughout U. S. industry.

3. **What is equipment leasing?**

Equipment leasing is a method of obtaining the use of income-producing equipment (fixed assets) without capital investment. When equipment is obtained in this way for use in production, the units remain the property of the leasing company, but are used by the lessee, who pays the leasing company a fixed charge for a stated period for using the equipment.

Leasing is a long-term arrangement, normally from three to 10 years, though in some cases it may be as little as two years or as long as 15 years. It is different from equipment *rental* which is a short-term affair, in which the rental firm rents out new or used pieces for a brief period, reclaims them at the end of the period, and then rents the equipment to other users.

4. **How does equipment leasing work?**

A company which wishes to lease equipment from Nationwide Leasing Company, for example, submits an application describing itself — its business, its financial position, etc. It lists the specific manufacturer from whom it wishes to secure the equipment, the price of the equipment, the length of the lease terms it desires, and the form of payment it desires.

The leasing company then purchases the equipment and arranges for its shipment directly to the lessee's plant. Upon acceptance of the equipment, payments start. All equipment, no matter how many items are involved, can be covered by a single master lease and can be paid for in a single monthly payment. This is true regardless of how many suppliers are involved. This reduces the user's bookkeeping considerably.

5. **What types of equipment are leased?**

All types. In 1958, equipment leased ranged in cost from a $17 hand truck (part of a $140,000 equipment lease with a midwestern hospital) to $5,000,000 worth of construction equipment. Both standard and specially-built units can be leased.

6. **Why has equipment leasing increased so rapidly?**

Basically, equipment leasing has increased as a result of the steadily increasing cost of capital equipment. Leasing has historically been a means of permitting businessmen to function without owning everything they need to do business, since profits are made by *using* capital equipment, rather than *owning* it.

Specific reasons for the current growth of equipment leasing are:

a. Profit-producing equipment is put to work without capital investment. This is particularly important since working capital remains tight, despite the slight improvement resulting from inventory liquidation.

b. To increase profits without increasing a company's own capital investment.

c. To increase production without reducing liquidity of working capital.

d. To reduce the risk of loss caused by rapid obsolescence of specialized equipment.

e. To obtain equipment for limited-term use, either for special orders or for developmental or research work. This is particularly important where firms are involved in defense contract work.

f. For manufacturers of industrial equipment, leasing programs have proved to be an effective method of increasing sales.

7. What are the advantages of leasing?

Other advantages to users of leased equipment, in addition to those cited in the answer to Question 6, lie in how leasing improves a company's financial situation.

a. Leasing offers financing without dilution of ownership or control.

b. In leasing, there is no necessity for a periodic cleanup of funds or a pledge of receivables.

c. Leasing may offer certain tax-timing advantages in specific instances.

d. Leasing makes for a cleaner balance sheet. Only the lease payments due within 12 months appear on the balance sheet, thus affecting the ratio of current assets to current debt very little, As a result, a company is able to use its established lines of credit for short-term borrowing without disturbance.

8. What types of companies lease equipment?

All types of companies in virtually every industry today lease equipment. They range in size from quite small companies (restaurants and motels, for example) to giant companies in the billion-dollar-a-year sales category.

According to Nationwide Leasing Company's annual surveys, the 10 leading industries using leased equipment in 1958 were nine manufacturing industries and the supermarket industry. They are (in alphabetical order): aircraft and parts; chemicals and drugs; construction and road-building; electrical equipment and machinery; fabricated metal products; food products; petroleum refining; printing and publishing; pulp, paper, and allied products; the supermarket industry. This year marked the first time a non-manufacturing industry (supermarkets) was ranked among the top 10 users of leased equipment.

9. What is the length of equipment lease terms?

Terms range generally from three to 10 years or longer, though in some cases, where smaller sums are involved, they can be as little as two years. The user determines the length of lease he prefers, arranges the payments to suit his own needs. Leases are usually written on a uniform payment basis although they can be written on straight line, declining balance, sum of the digits, or any schedule preferred by the user.

10. Is equipment leasing useful as a sales tool for manufacturers of production equipment?

In a number of industries, leasing programs have proved to be an effective method of increasing sales, through offering customers the option of purchase or lease — with the leasing company assuming the lease contract and paying the manufacturer 100 per cent cash for the equipment when the equipment is delivered. The leasing company sets up a complete sales training program for the manufacturer so that his leasing plan will have maximum impact.

In merchandising-leasing plans, leasing is used as a primary sales tool, giving the manufacturer's salesmen an important new way to move goods. The customer has the benefit of the lease — the manufacturer has a cash sale. Not only does this normally enable a manufacturer to increase his sales by the added leasing volume, but the interest generated around the leasing plan results in opening new markets for the product and inevitably results in increased direct sales, often greater than the leasing volume.

11. How does leasing compare with other methods of financing?

Leasing offers 100 per cent financing and provides the manufacturer with greater cash flow than other financing methods. As a result, the relative cost of leasing is less than other methods.

Any expenditure of money to acquire equipment involves paying something for the use of the money. Even in the case of outright cash purchase, the manufacturer is sacrificing the earnings his working cash would yield; this, in effect, is what he is "paying" for the use of his own money. For Southern industries this means a "cost" of from 20 to 92 per cent — the range of *before-tax* profits on net working capital for all industries. For most individual manufacturers the "cost" is between these two figures.

Leasing frees more working capital immediately than any other method of obtaining equipment. This cash excess earns profits for a manufacturer at his company's normal rate for the life of the lease. Over the term of the lease the additional profits produced by this cash excess (at the rates cited above, for example) will be so great that the relative cost of leasing is likely to be less than other financing methods.

A complete analysis of the comparative cost of leasing and other financing methods, entitled "Lease or Buy? Comparative Costs of Equipment Acquisition," has been developed by the Foundation for Management Research. Single free copies of this study may be obtained by writing to the Foundation at 121 West Adams Street, Chicago 3, Illinois.

12. What are recent trends in leasing?

Two new trends have shown themselves: (1) the sale-leaseback transaction (commonly, but erroneously, termed purchase-leaseback) and (2) merchandising - leasing plans involving the cooperation of equipment manufacturers and a

leasing company to increase sales.

In the sale-leaseback transaction, a company builds a new plant, sells the equipment and facilities to the leasing company as soon as it is completed and ready for use, and immediately leases it back. *Often this is done with older plants also.* This enables firms whose financial ratios would not otherwise permit them to expand at so great a rate, to do so without straining their capital structure.

13. **What operating situations make leasing most advantageous?**

a. In general, where companies can expand their operations profitably, if additional equipment and machinery were made available at smaller annual expense than through use of their own capital.

b. Companies which find themselves short of working capital but which have sufficient equipment, can remedy the situation through sale-leaseback transactions.

c. Companies faced with competition that is using the latest equipment, while they themselves lag on cost-saving. In this situation, acquiring the new equipment is essential, but often a large initial cost is prohibitive. In this case, leasing can often provide the solution.

d. Companies which hold a tight check rein on capital expenditures and financial ratios. Leasing permits the management of these companies to secure new equipment without requiring the board of directors to raise more capital.

e. Where rapid obsolescence is a strong possibility, leasing bypasses the problem of capital investment in such equipment.

f. For pilot plants, developmental or experimental projects, leasing offers a means of opening new areas of production without draining working capital on such unproved ventures.

g. Companies engaged in defense contract work are often enabled, through leasing, to obtain needed equipment for the term of the contract. In this way capital is not frozen in equipment which may not be useful after the contract has been fulfilled.

14. **Do leasing agreements contain purchase options?**

Yes, leasing agreements can contain purchase options. However, Nationwide Leasing Company advises against including purchase options in the leasing agreement. The reason is that a purchase option generally converts a leasing agreement into a conditional sales contract, in the eyes of the Internal Revenue Department. There are some exceptions to this general rule, but these exceptions are uncertain and depend on specific rulings by the Internal Revenue Department at the conclusion of the contract, many years later.

For this reason, purchase options are not recommended. True lease payments, as differentiated from disguised conditional sales contract payments, are legitimate deductions as operating expenses. Conditional sales contracts are deductible only at the rate specified in the federal government's depreciation schedules.

15. **Do leasing contracts contain renewal options?**

Yes, of course. In leasing, the cost of the equipment is paid for entirely in the original leasing term. Renewal options are usually available at extremely low cost. They can range in length from one-year options to indefinite terms.

16. **Does leasing offer companies tax advantages?**

This has been an area of much misinformation. Leasing is not a method of tax avoidance; its primary value lies in the way it frees working capital for other uses. In certain specific situations leasing may also offer companies advantages of tax-timing which is not to be ignored. Leasing charges are legitimately deductible as business expenses. As such, they reduce taxable income now.

Leasing may also offer a tax advantage that can be of particular importance to companies which find that their equipment tends to become obsolete much more quickly than government depreciation tables permit. For example, a company using equipment that experience shows it can expect to have to replace in seven years, may find that depreciation tables permit depreciation only over 15 years.

By leasing this equipment for a seven-year period, this company would be able to deduct the full cost of the equipment from taxable income in seven years. If the company had purchased the equipment, it would only have used seven years' worth of depreciation and would have to forego further depreciation benefits, if it wished to replace the equipment at the end of seven years.

In certain sale-leaseback situations also, tax advantages may accrue, since the sale of an asset normally involves taxation at the capital gains rate, if a profit is made, rather than at the corporate rate.

17. **How can I tell if my company should lease or buy?**

There is no method of financing that fits every situation equally. Factors to be judged include the availability of working capital, the rate of profit the company earns on its working capital, the effect of leasing on the company's cash flow as compared with other financing methods, the company's competitive situation, and whether there are any tax advantages in the company's special situation.

Oil Leaks Stopped

OIL KEPT leaking out of several of our station transformers — running down off the drip loops on the primary cables where they entered the pot. This meant periodical refilling and checking of the oil, as well as constant watch over the oil drip to the floor.

We traced this to the fact that the cables bore candlewick insulation. By capillary attraction, the oil came up the cables from inside the transformers, then dropped off the drip loops.

Our remedy was simple enough. On a day when the plant was shut down and we could throw the juice off, the cables were disconnected inside the transformer tank, pulled out, and a knife used to make deep circular cuts ringing the insulation all the way down until the knife struck the copper conductor. Such rings were made at intervals of an inch apart for a total of four rings, and we've had no trouble since.

As the oil attempts to creep, the serrations in the insulation effectively stymie it.

By HARRY J. MILLER
Sarasota, Florida

Problem: A NEW MANUFACTURER OF BOATS NEEDED TO FIND A RELIABLE SOURCE OF SUPPLY FOR ALUMINUM SHEETS

Solution:

IN AUSTELL, GEORGIA, a manufacturing operation was begun in the summer of 1957. This company, Pioneer Manufacturing Company, produces a line of aluminum pleasure boats, weighing from 88 pounds apiece up to much larger craft. Mr. J. O. White (far right), the owner, needed a source of aluminum, one that he could rely on to stock the material he needed and deliver it when he wanted it.

MR. WHITE called John Cook at our Atlanta Branch and told him about his requirements. Mr. White wanted to get started right away, and John arranged for his first order, 500 pounds of 5052 H34 aluminum sheets, to be loaded on one of our trucks and delivered the same day. Since that day two years ago, every one of Pioneer's numerous orders has been delivered on time, saving Mr. White the trouble and high cost of stocking large quantities of aluminum in his own shop.

THE SEASONAL BUSINESS that Mr. White has is an important factor for any small manufacturer. While he operates continuously through the winter to stockpile boats for the spring, demand naturally is subject to considerable fluctuation during the season. It is extremely important to Mr. White to have a source of supply flexible enough to meet unexpected calls for material. The ability to ship immediately out of stock plays a vital part in Reynolds Aluminum Supply Company's service to Mr. White.

THIS SAME STORY could be told about any one of the ten Reynolds Aluminum Supply Company branches. Vast inventories of metals and other industrial products are maintained constantly. Having these materials available to you in the quantities you need, large or small, at the times you need them, is our whole purpose. It will pay you to call our branch nearest you today and turn your inventory problems over to them. The address and telephone number are listed below.

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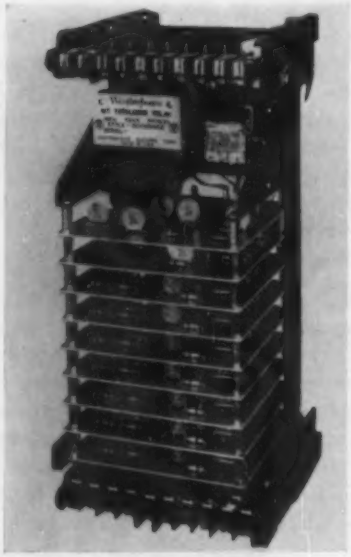
NEW Product Briefs

. . . there is always a BETTER WAY

Totalizing Relays

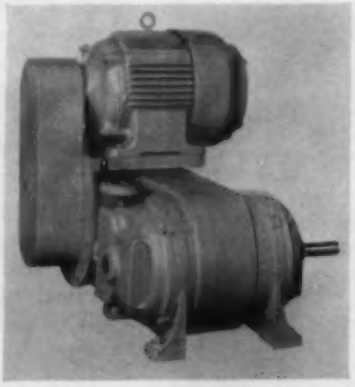
K-1 **Westinghouse Electric Corporation,** Pittsburgh 30, Pa., has announced the production of impulse totalizing relays for multiunit metering of power distribution systems. The new relays use semiconductor devices to combine demand impulses from as many as seven sources and to retransmit them over a single output circuit. With the exception of one output relay, all circuit elements are conservatively rated static devices — transistors, silicon diodes, condensers, and resistors — which operate reliably at high impulse rates for long periods.



The new equipment is compatible with all existing systems without changes in input pulsing equipment or the final impulse receiver. Available with capacities of 3, 5, or 7 input channels, the relays have a common maximum output rate of 450 impulses per minute, but a maximum input rate that depends on the number of input channels to be totalized.

Separate Motor Drive

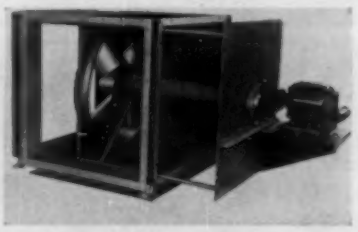
K-2 A mechanical variable speed drive featuring separate motor construction and horizontal assembly is now available from **Sterling Electric Motors, Inc.,** 5401 Telegraph Road, Los Angeles 22, Calif.



Separate motor drives meet JIC standards, they are more compact because of the "piggy-back" construction, and a wide selection of infinitely variable output speed ranges is realized through the proper selection of the v-belt and the timing belt. Drip-proof, totally-enclosed, explosion-proof, and a wide variety of other special motors are available.

Packaged Elbow Fans

K-3 A new design of elbow fan for general ventilation and for use with such equipment as furnaces, dryers, ovens, kilns, and plating and pickling tanks, has been introduced by **L. J. Wing Mfg. Co.,** Linden, New Jersey. Standard units can handle clean or slightly contaminated air or fumes at normal or elevated temperatures. Special construction accommodates corrosive or explosive conditions. Installed in ductwork, the unit occupies only slightly more space than a standard elbow.



The fans are available in five basic sizes with a wide choice of motors, for capacities from 600 to 32,000 cfm at static pressures to 2 in. or more. Standard fans can handle up to 750 F. Higher temperatures can be accommodated by admitting diluting cooling air.

Distribution Center

K-4 A new integral distribution center with high-temperature insulation that is up to 30 per cent smaller, 15 per cent lighter than previous designs, and 16 decibels quieter than NEMA Standards for transformers of similar ratings, has been introduced by the **General Electric Company,** Schenectady 5, N. Y.

The new one-piece design combines incoming line switch and fusing, transformer, and outgoing feeder breakers. The standard line is completely metal-clad and is available in ratings from 75 to 225 kva.

KEEP-UP-TO-DATE
USE SPI
READER SERVICE

See Page 65

CONDENSATE DOES NOT COLLECT
This small piston-like valve, only moving part in the Yarway Impulse Trap, continually tests for condensate, discharges it as soon as it forms.
CLOSED POSITION
OPEN POSITION

Yarway Impulse puts the heat on steam trap freeze-up problems

Cold weather means nothing to a Yarway Impulse Steam Trap. *Its design offers full protection against freeze-ups,* with resulting costly production delays and extra maintenance work.

In the Yarway Impulse Trap there's nothing to freeze. No condensate collects. The only moving part (a tiny piston-like valve) continually tests for condensate and discharges it as soon as it forms. Result—continual operation of steam equipment at high, even temperatures.

Consider this non-freeze feature with these other Yarway Impulse features:

- **Quick heat-up**
- **Low maintenance**
- **Stainless steel construction**
- **Small size—light weight**
- **Good for all pressures**
- **Complete line for all requirements**

—and you have the reasons for nearly 1,300,000 successful installations.

Stocked and sold by 270 Industrial Distributors, coast-to-coast and around the world.

YARNALL-WARING COMPANY

Home Office: 116 Mermaid Ave., Phila. 18, Pa.
Southern Office: Bona Allen Bldg., Atlanta 3, Ga.

YARWAY

A MARK OF QUALITY IN STEAM ENGINEERING

INCREASE PRODUCTION

with New SUN-X Glass Tinting

Now you can economically protect your employees from the dangerous, fatiguing effects of the sun's strong rays... provide comfortable working light... and help prevent mistakes and accidents.

New Sun-X Glass Tinting, a liquid plastic development by Du Pont, makers of "Better Things For Better Living... Through Chemistry," gives you positive, all-day sun control. Laboratory tests prove conclusively that Sun-X can eliminate up to 95% of the light rays causing glare.

New Sun-X Glass Tinting is applied quickly and neatly to your existing windows by a unique miracle-flow process. It bonds tightly and is *guaranteed in writing* not to chip, crack or peel. No maintenance is required — you wash Sun-X tinted windows in the usual manner.

Available in your choice of 11 distinctive colors, Sun-X Glass Tinting gives you the distortion-free appearance, the trouble-free convenience of expensive factory-tinted glass *at a fraction of the cost.*

To see how Sun-X can more than pay for itself in increased production, send now for your free copy of "Solve Sun Problems with Sun-X."

SUN X

DUPONT MANUFACTURED BY DU PONT

International Distributors

AMERICAN GLASS TINTING CORPORATION

4125 RICHMOND AVE. • HOUSTON, TEXAS

New Product Briefs (Continued)

Speed Reducers

K-5 **The Cleveland Worm & Gear Company**, 3300 East 80th St., Cleveland 4, Ohio, has announced a new line of speed reducers capable of transmitting as much as 80 per cent more horsepower than conventional units. Speed reducers ranging from 1 hp to 40 hp are already in production.

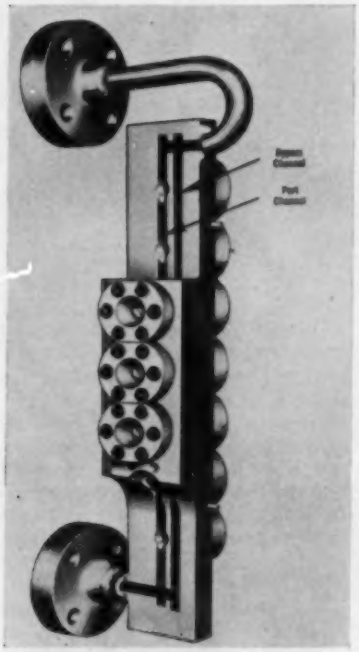
Aluminum Pipe Fittings

K-6 A complete line of aluminum fittings for schedules 10 and 40 pipe is announced by the **Speedline Division, Horace T. Potts Co.**, Erie Ave. & D St., Philadelphia 34, Pa.

Aluminum reduces both the cost and weight of the supporting structure as well as providing economic corrosion resistant process lines. Aluminum is non-sparking, an essential in process industries where explosion is a hazard, and also has a low friction factor that increases flow efficiency and reduces pumping cost. The new line of fittings incorporates the extra length feature which gives more clearance for welding, simplifies alignment, allows for flanging without welding, and permits a multiple choice of joint at every connection.

Boiler Water Gauge

K-7 **Diamond Power Specialty Corporation,** Lancaster, Ohio, has introduced a Bi-Color Multi-Port gauge suitable for pressures to 3000 psig, and designed to improve water level indication and visibility by providing sharper red and green colors.



In this patented construction, condensate flows down through a bypass channel instead of through the observation channel, thereby assuring a distinct signal red for steam, and signal green for water, improving readability. Condensate flowing through the bypass enables the centerplate to retain a relatively high temperature and therefore does not affect indication of water level in the gauge.

Aerosols

K-8 A complete line of aerosol products for industry is offered by **Sprayon Products, Inc.,** 2075 E. 65th St., Cleveland 3, Ohio. The new line consists of 47 maintenance and production aids in self-spraying containers.

The Sprayon line includes color code enamels and marking paints, standard equipment finishes, special lubricants, protective coatings, and de-greasers. It covers virtually every self-spraying product used in industry, from silicone mold release to blue layout fluid.

MOST COMPLETE LINE

Eleven Product Groups Serve Every Sealing Need

GROUP NO. 1

High Pressure Asbestos Packings

Solid, hollow center, metal center, rubber center and rubber-backed, woven and braided asbestos types for severe service against wet and dry steam, air, gases, and hot oil at temperatures up to 600° F, on piston rods, valve rods, valve stems, expansion joints, compressors, etc.

There is a Belmont Packing for Every Sealing Service. See your Belmont Distributor, or write for name of one nearest you.

OTHER BELMONT PRODUCT GROUPS

2. Valve Stem Packings
3. Rotary Pump Packings & Seals
4. Criss-cross Braid Packings
5. Hydraulic Packings
6. Bel-Vee V-Rings
7. Sheet Packings
8. Gaskets
9. Metallic Packings
10. Plastic Packings
11. Expansion Joints

MOST CONVENIENTLY AVAILABLE

Nationwide Industrial Distributor Organization Provides On-the-Spot Service

BELMONT

The Belmont Packing and Rubber Company
Butler & Sepviva Streets, Phila. 37, Pa.

Two 30-hp Monitor boilers at an eastern laundry replaced older boilers. Owner estimates Monitor boiler efficiency will pay for cost in three years.

Here's big performance from a small package

Cleaver-Brooks Monitor boilers are compact sources for dry steam — more of it at less cost means more profitable plant operation

Whatever your need for dry steam, Monitor packaged boiler will slash your costs, speed your operations. By any test, Monitor boiler is a practical investment in working steam.

Take fuel economy, for example. High fuel-to-steam efficiency — guaranteed at 80% minimum — can save your plant hundreds of dollars over boilers just 10% lower in efficiency. Monitor boiler is designed to the standards of larger industrial boilers to provide excellent heat transfer, high combustion efficiency, proper air-fuel ratios.

You'll find 99% dry, working steam, ready response, and ample steam reserve make Monitor boiler a real workhorse for any job.

Factory tested, delivered as a complete package, ready to operate.

Available in sizes 15-60 hp, 150 psi, oil, gas and combination oil/gas fired. For the complete Monitor story, contact your representative or write Cleaver-Brooks Company, Dept. 41, 3805 E. Keef Ave., Milwaukee 12, Wisconsin.

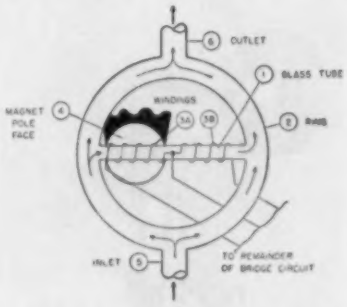
WE CAN DELIVER NOW

Cleaver Brooks®

ORIGINATORS AND LARGEST PRODUCER OF PACKAGED BOILERS

Low Range Oxygen Analyzer

K-9 **The Hays Corporation,** Michigan City, Indiana, has introduced a new analyzer specifically developed for measurement of low concentrations of oxygen.



Designated Model 632, the analyzer is available in three different ranges: 0 to 1%, 0 to 2%, 0 to 3%. The analyzer is not affected by H_2 concentrations up to 50%, is sensitive to changes as low as .01% oxygen, and is accurate to ±2% of range. The hydrogen insensitivity makes the unit particularly well suited for 0_2 measurement in inert gas atmospheres, petroleum processes, and other high hydrocarbon mixtures.

This analyzing cell (see diagram) consists of a doughnut-shaped gas passage (2) with a glass cross member (1) and with inlet and outlet (5 and 6) pipes as shown on attached schematic. Oxygen-bearing gas is drawn into the magnetic field at (4), is heated and, in so doing, cools winding (3A). Cooler, more magnetic gas is drawn in from the left, forcing the previously warmed gas past winding (3B), in turn warming that winding. The temperature difference is interpreted as per cent oxygen.

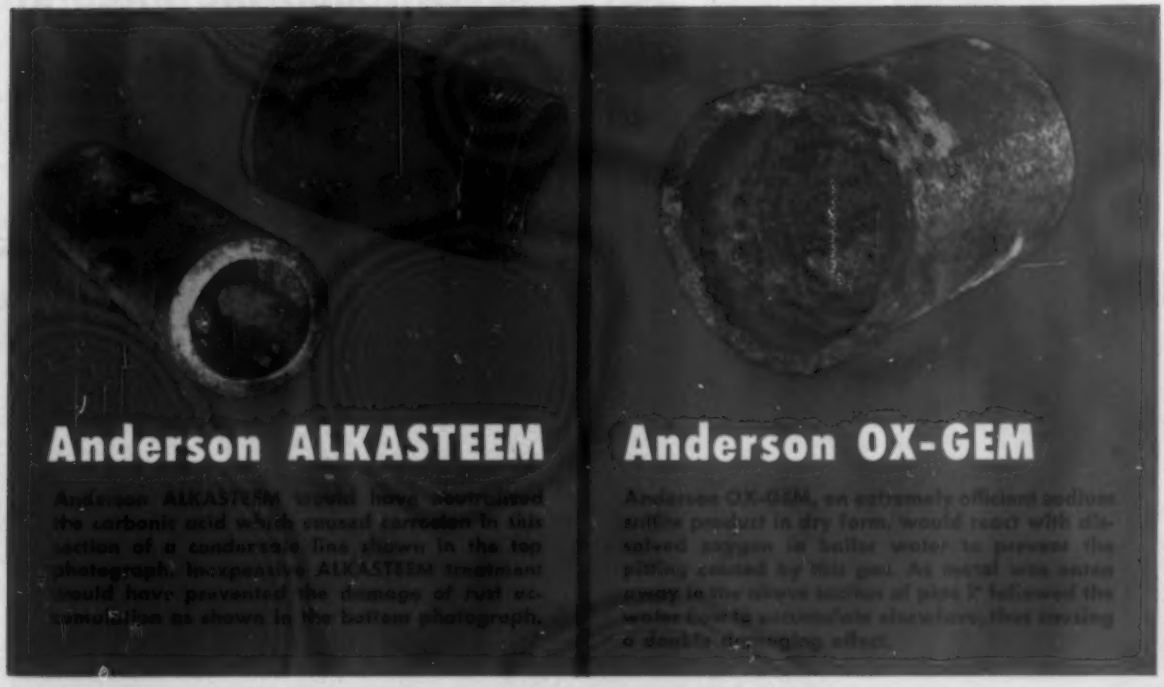
New Carbon Remover Introduced by Oakite

K-10 A new solvent detergent designed to remove carbon from pistons and to clean a wide variety of engine parts has been announced by **Oakite Products, Inc.,** 123A Rector St., N. Y.

Oakite Composition No. 111 is effective mixed with water or with petroleum distillates. It may be used at room temperatures or heated to about 100 F and is easily rinsed with water or steam. It contains no phenolics, so disposal of spent solutions presents no special problem.

YOU CAN STOP CORROSION

in your boilers, steam lines and condensate lines



Anderson ALKASTEEM

Anderson ALKASTEEM would have neutralized the carbonic acid which caused corrosion in this section of a condensate line shown in the top photograph. Inexpensive ALKASTEEM treatment would have prevented the damage of rust accumulation as shown in the bottom photograph.

Anderson OX-GEM

Anderson OX-GEM, an extremely efficient sodium sulfite product in dry form, would react with dissolved oxygen in boiler water to prevent the pitting caused by this gas. As metal was eaten away in the above section of pipe it followed the water line to accumulate elsewhere, thus causing a double damaging effect.

You can stop the corrosion at the water line and above it in boilers, steam lines, steam traps, valves, unit heaters and return condensate lines. Corrosion is more frequently caused by dissolved gases such as carbon dioxide and oxygen. When these gases occur in combination the rate of corrosion is greatly increased. If corrosion is allowed to go unchecked the result, of course, is costly shut-downs for repairs and expensive replacements.

Throughout the South, hundreds of engineers rely on Anderson ALKASTEEM and OX-GEM and the counsel of Anderson's field service representatives to check these corrosive gases. The life of equipment is prolonged and the operating efficiency of your water system is increased. The Anderson man is a good man to know.

FREE SURVEY AND ANALYSIS SERVICE

Anderson Service Representatives will be glad to discuss your particular water problems and make recommendations based on an analysis of the makeup water. There is an Anderson representative in your area who will gladly work with you. His services cost you nothing. They can save you much.

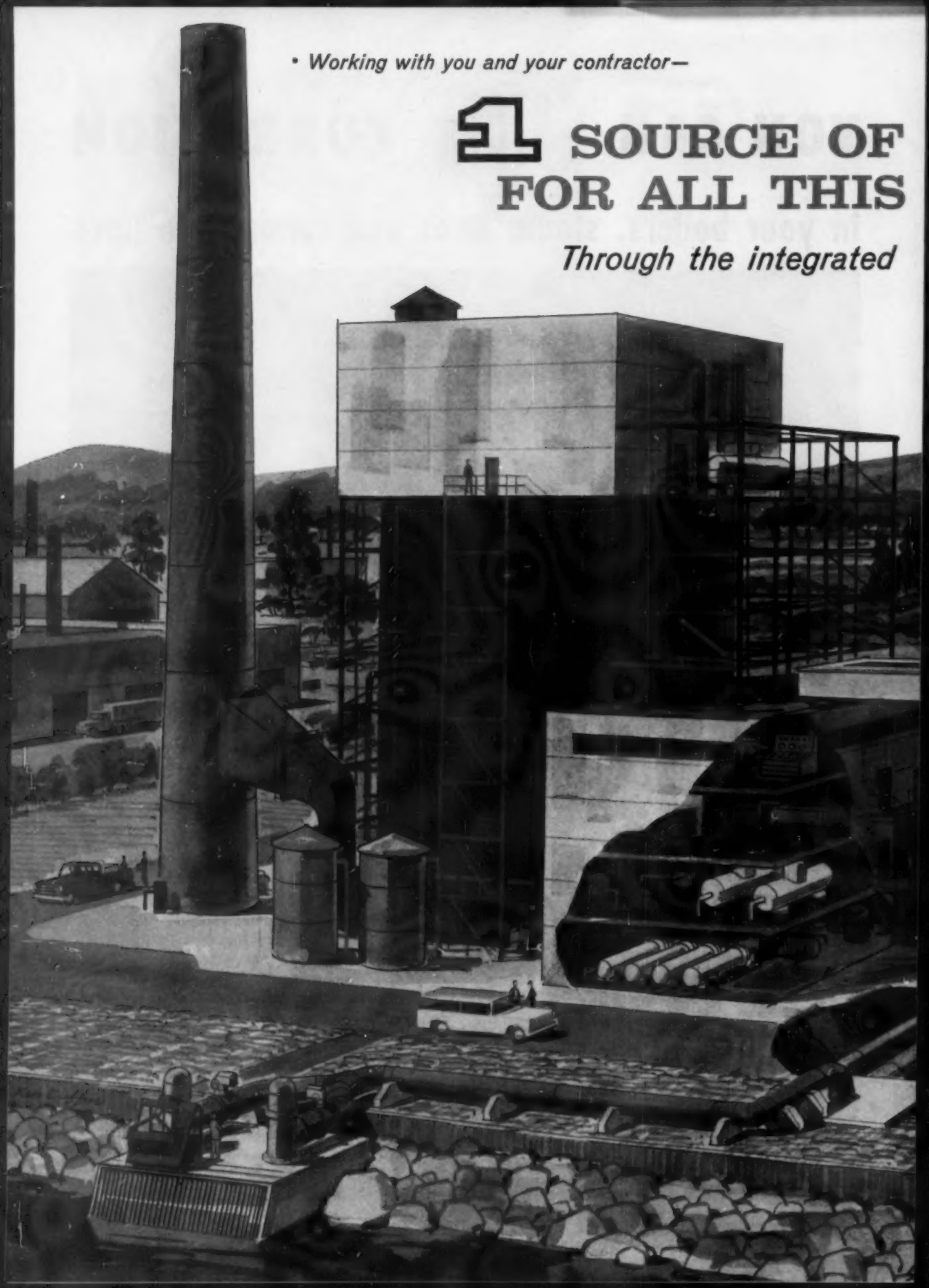
Write, Wire or Phone

SPECIALISTS IN MAKING WATER BEHAVE

Anderson Chemical Company, INC.

Macon, Ga.: Box 1424 • Phone 5-0466

Memphis, Tenn.: Box 2432, DeSoto Station • Phone: BRoadway 2-2806



• *Working with you and your contractor—*

1 SOURCE OF FOR ALL THIS

Through the integrated

SUPPLY 1 RESPONSIBILITY POWER PLANT EQUIPMENT

facilities of YUBA—NATIONWIDE to serve you best

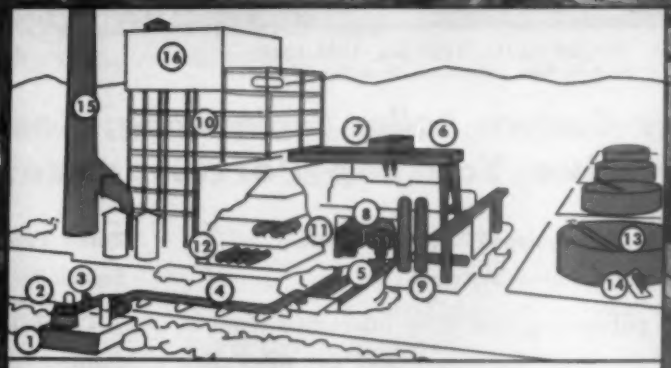
The problem of coordinating all the purchases and delivery of specialized equipment for steam plants can be greatly simplified—when it is packaged as a single responsibility with Yuba.

The advantages to you, your consultants and your contractor are many. They can easily add up to major savings in time, money and trouble. The experienced Yuba organization is geared to deliver a fully integrated service every step of the way: through equipment design, engineering, manufacturing, installation and erection.

Operating nationwide, the divisions and manufacturing plants of Yuba serving the power industry are ideally equipped and located to maintain the highest product quality standards and meet the most demanding completion dates—economically.

Call in your Yuba man. Discuss your plans and problems with him. See how your job can be made easier with his and Yuba's help.

DIVISIONS AND SUBSIDIARIES SERVING THE POWER INDUSTRY: Yuba Heat Transfer Division • Adsco Division • Yuba Manufacturing Division • Southwest Welding & Manufacturing Division • Judson Pacific-Murphy Division • Yuba Consolidated Erectors, Inc.



YUBA PRODUCTS FOR STEAM POWER PLANTS

1. Intake gates
2. Trash racks and rakes, guides
3. Butterfly valves
4. Penstocks
5. Expansion joints
6. Gantry or semi-gantry cranes
7. Hoists
8. Surface condensers
9. Feedwater heaters
10. Structural steel work
11. Evaporators
12. Fuel oil preheaters
13. Oil storage tanks
14. Tank suction heaters
15. Steel stacks
16. Surge tanks

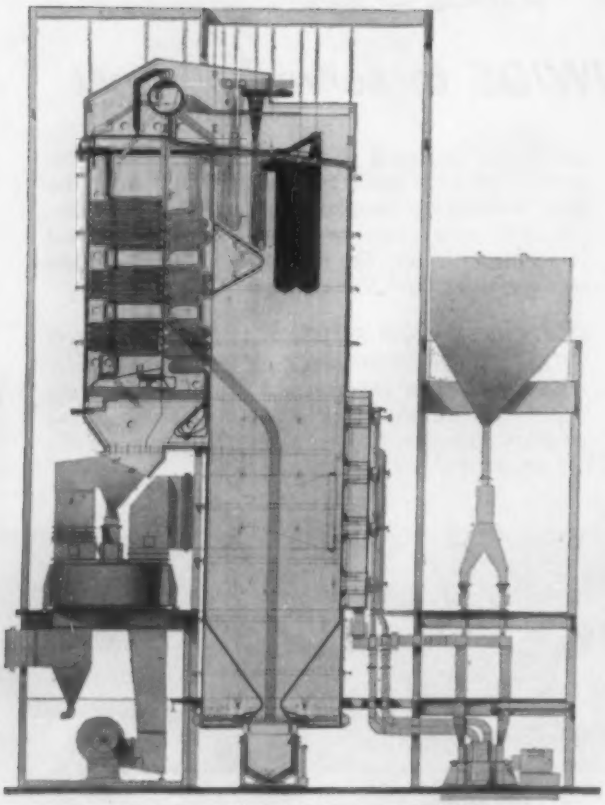
A print of this power plant artwork, suitable for framing, is available free of charge. Write Yuba Consolidated Industries, Inc., Dept. SP, 351 California St., San Francisco, California

YUBA

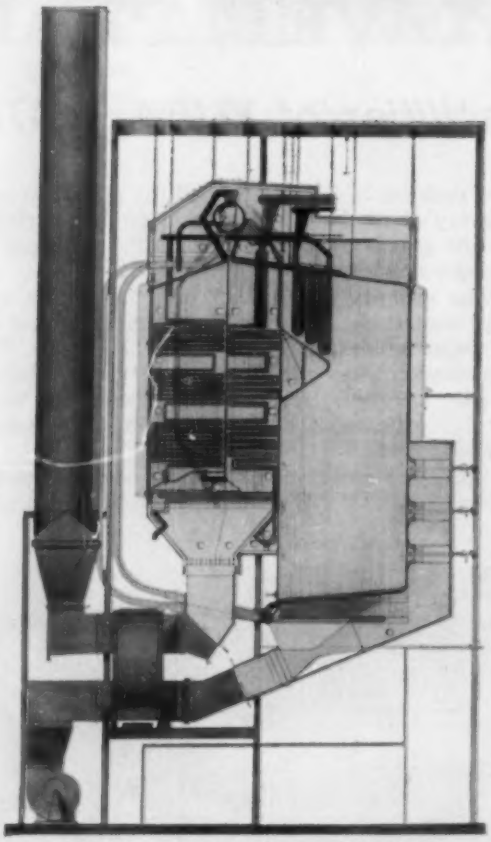
YUBA CONSOLIDATED INDUSTRIES, INC.

351 California Street, San Francisco, California

Are You Planning To Burn COAL? OIL or GAS?



950,000 lbs./hr., 1950 psig, 1000/1000F;
Fired By Riley Pulverizers, Flare Type Burners



1,020,000 lbs./hr., 1925 psig, 1005/1005F;
Fired By Gas, Oil — Pressurized Furnace

Riley Custom Boiler Engineering, Know-How In Combustion Can Give You Top Performance Regardless Of The

Riley Boilers Equipped With Complete Riley Fuel Burning Systems

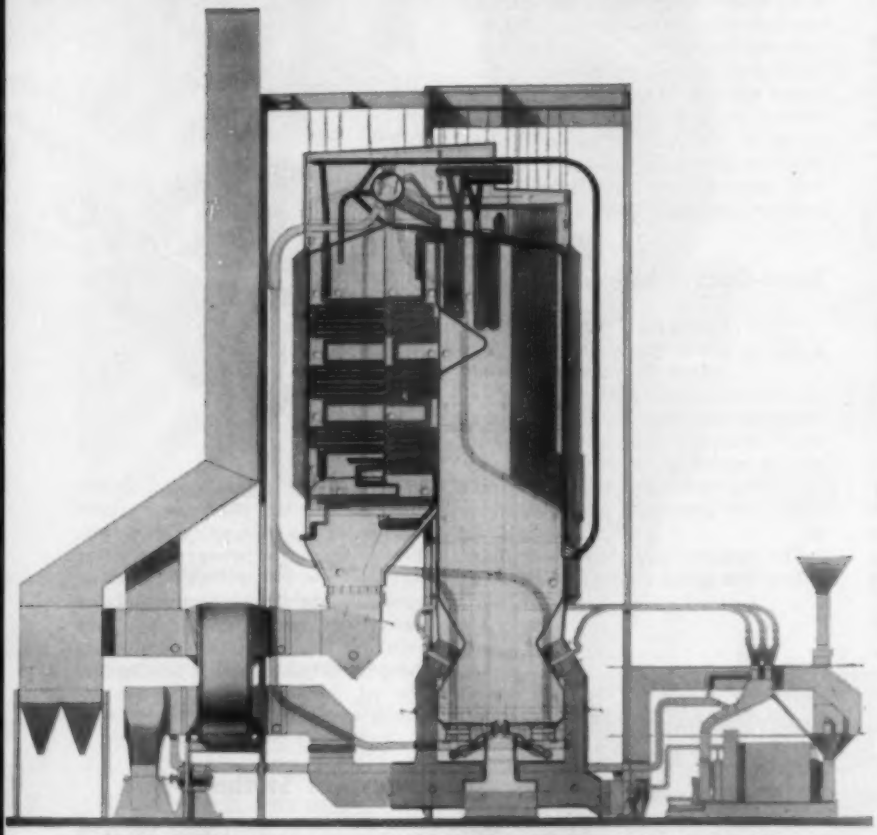
For pulverizing coal Riley offers two types of mills: the Riley Pulverizer and the Riley Ball Mill. These are used with either horizontal Riley Flare Type Gas/Oil/ Coal Burners, or with Riley multiple fuel Directional Flame Burners in Turbo Furnaces. A Riley Boiler installation complete with Riley fuel burning equipment assures Riley's undivided responsibility.

Turbo Furnace Boilers Designed Especially For Multiple Fuels

The Riley Turbo Furnace is ideally suited to firing multiple fuels. When firing coal furnace remains slag-free, flyash disposal is eliminated, carbon loss is negligible. Flame characteristics of gas, oil and coal are similar, simplifying steam temperature control. Available with reheat, non-reheat, with pressurized and non-pressurized furnaces in all capacities and pressures.

A Survey Of Your Plant by A Qualified Consulting Engineer Can Show You Ways To Make

or ALL THREE ?



1,600,000 lbs./hr., 2125 psig, 1005/1005F; Turbo Furnace with Riley Ball Mills; Pressurized Furnace. Fuels — Gas, Oil, Coal

SOME PUBLIC UTILITIES USING RILEY EQUIPMENT

Louisiana Power & Light Co. (3)
Texas Electric Service Co. (3)
Houston Lighting & Power Co. (13)
Dallas Power & Light Co. (3)
Kansas Gas & Electric Co.
Public Service Co. of Indiana, Inc. (12)
New Orleans Public Service, Inc. (3)
The Holyoke Water Power Co.
Columbus & Southern Ohio Elec. Co.
Central Illinois Light Co. (8)
Hartford Electric Light Co.
Central Power & Light Co.
Monongahela Power Company
Arkansas Power & Light Co.
Southwestern Gas & Electric Co.
Utah Power & Light Co. (3)
Florida Power Corporation (2)
Delaware Power & Light Co.
Minnesota Power & Light Co. (2)
Pacific Gas & Electric Co.
Iowa Public Service Co.
Commonwealth Edison Co.
Manila Electric Co.
Southern Nevada Power Co.
Interstate Power Co. (7)
Northern States Power Co.
Central Louisiana Elec. Co. (2)
Union Electric Co. of Ill. (2)
Northern Virginia Power Co.
Union Electric Co. of Mo. (7)
Pennsylvania Electric Co.
Iowa Electric Light & Power Co. (3)
Iowa-Illinois Gas & Electric Co. (7)
Montana-Dakota Utilities Co.
Mississippi Power Company
Philadelphia Electric Co. (4)
Central Ohio Light & Power Co. (6)
Gulf Power Co. (4)
Otter Tail Power Co. (5)
Public Service Elec. & Gas (N.J.) (7)
So. Carolina Elec. & Gas Co. (3)
Taiwan Power Company (2)

Numbers indicate Repeat Orders

Techniques, Selectivity Of Fuel Burning Equipment Nature of Fuel, Load, and Steam Conditions

Riley Provides Skilled Construction Engineering Services

Riley Stoker Corporation supplies complete construction services. Riley construction crews employ the latest in construction methods and techniques.

Experienced Service Engineers Assist In Maintaining Safe, Efficient Operation Of Your Boiler

Riley Service Engineers are trained for prompt and efficient servicing of all Riley installations. These experienced engineers work closely with your operators.

Riley Stoker Corporation, having successfully met the challenge imposed by the remarkable growth of the public utilities in the past decade is thoroughly prepared to meet the even greater challenges to come.

You'll Find A Riley Office In Each Of These Principle Cities:

Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Jacksonville, Kansas City, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Salt Lake City, San Francisco, Seattle, St. Louis, St. Paul, Syracuse, Worcester.

RILEY STOKER CORPORATION, WORCESTER, MASS.

Surprising Savings In Your Power Costs

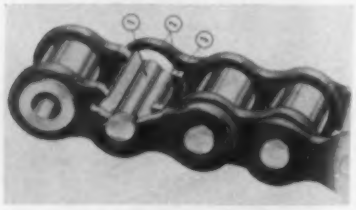
RILEY

STEAM GENERATING & FUEL BURNING EQUIPMENT

New Product Briefs (Continued)

Oil-Impregnated Chain Bushings

K-11 Oil-impregnated, sintered steel bushings, an exclusive, patented development of research by the **Whitney Chain Company,** a Subsidiary of Foote Bros. Gear & Machine Corporation, 303 W. Hamilton St., Hartford 2, Conn., provide life-time lubrication for Whitney MSL (Maximum Service Life) Chain.



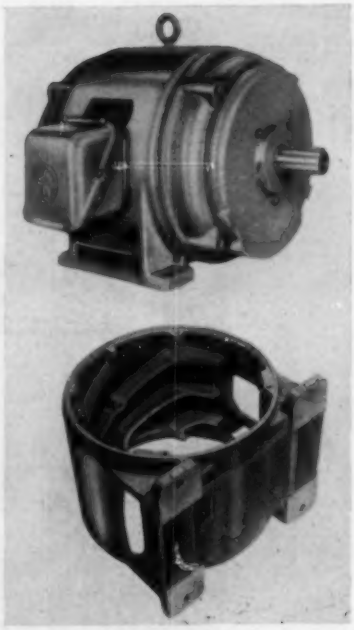
Pressure and heat cause built-in lubricant to expand and flow from bushings, providing a constant supply of lubricant to every working part of the chain. When drive stops, bushings re-absorb oil, assuring a permanent oil supply for the life of the chain.

MSL Chain with oil-impregnated bushings assures built-in lubrication at all three critical chain lubrication areas shown in cut-away photograph: 1—protective film of oil completely lubricates the live bearing area between pin and bushing. 2—bushings extend beyond surface of inside plates to act as lubricated thrust bearings. 3—oil film on exterior surface provides constant lubrication between sprocket teeth and chain.

Spiro-Duct Cooling

K-12 **Fairbanks, Morse & Co.,** 600 S. Michigan Ave., Chicago 5, Ill., has announced its rerated frame 364U and larger dripproof ball bearing KZK motors which feature a completely redesigned and improved enclosure and ventilating system. Heat dissipating facilities are unusually well distributed.

The circulating of ventilating air within this motor frame is controlled



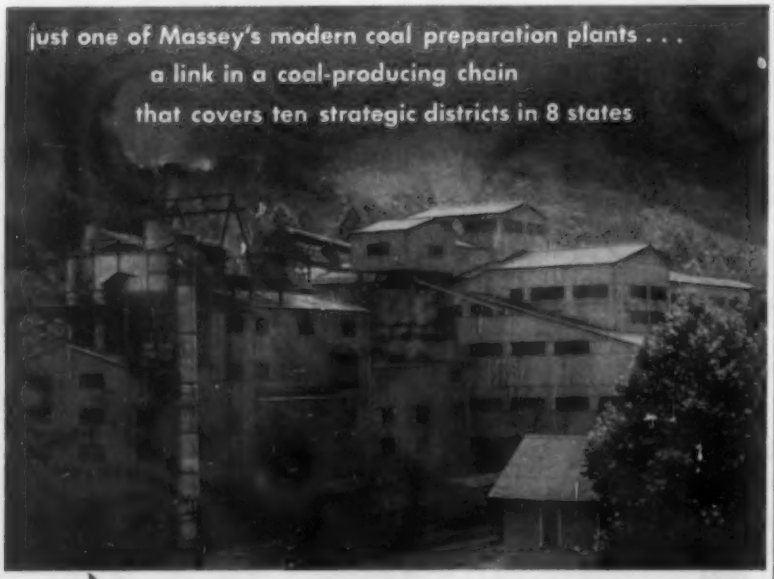
by a series of integral cast baffles illustrated in the photograph. Cooling air moves in a spiral direction, through the space between the stator core and the motor frame, assuring equal cooling for all portions of the stator core and winding. The two paths for cooling air are completely independent. Air intakes are located low on the end bells and air exhausts are between the motor feet.

Industrial Stethoscope

K-13 From diagnosing faults in machines and pipe lines, to testing pressure-tight packages, industry is finding uses for the new, low-cost, industrial stethoscope now offered by **Edmund Scientific Company,** Barrington, N. J.

With this rugged but sensitive instrument, the faintest knocks, taps, creaks, and leaks can be plainly heard.

The stethoscope sells for about half the usual cost, yet is claimed to be sturdy and well made for hard, everyday use. Price is $2.95 postpaid.


just one of Massey's modern coal preparation plants . . .
a link in a coal-producing chain
that covers ten strategic districts in 8 states

Whatever your coal needs—Massey's 21 famous brands can fill your "prescription." And Massey's 15-million ton annual output plus millions of reserve tons will assure a coal supply you can depend on . . . for years and years and years.

A. T. MASSEY COAL CO., INC.

CINCINNATI CHICAGO DETROIT CLEVELAND TORONTO

General Offices: Massey Building, Richmond, Virginia

CANCER'S DANGER SIGNALS

CAN BE SAFETY SIGNALS

You can do **two things** to guard yourself against cancer: Have an annual health checkup. Alert yourself to the seven danger signals that could mean cancer:

1. Unusual bleeding or discharge. **2.** A lump or thickening in the breast or elsewhere. **3.** A sore that does not heal. **4.** Change in bowel or bladder habits. **5.** Hoarseness or cough. **6.** Indigestion or difficulty in swallowing. **7.** Change in a wart or mole.

If your signal lasts longer than two weeks, go to your physician. Give him the chance to give you the chance of a lifetime.

AMERICAN CANCER SOCIETY

don't guess Liquid Levels...

Specify a Liquidometer Gauge

Easy to read as a clock. A Liquidometer Gauge indicates the exact level at all times ... shows it at a glance. And gauge operation is completely automatic—as far as 250 feet from the tank—without need for auxiliary power of any kind.

A Liquidometer Tank Gauge measures virtually any liquid. It's simple to install—requires no maintenance. Many have provided over 30 years of efficient, dependable service. All are approved by Underwriters' Laboratories and Factory Mutual.

Whether your gauging needs require an automatic Liquidometer Gauge, a hydrostatic Levelometer or a tank-site-indicating Direct Reader, you'll get the best by specifying Liquidometer. For complete details write Dept. F.

Since 1920 ...of proven quality

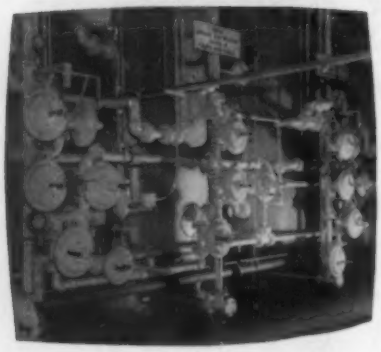
THE LIQUIDOMETER CORP.

LONG ISLAND CITY 1, NEW YORK

THESE NEW IDEAS HAVE COME FROM

ILLCO-WAY DESIGNERS AND BUILDERS

MODERN EQUIPMENT FOR ionXchange



Illinois Water Treatment Co. was incorporated over 20 years ago to use the newly-discovered resins in the development of ionXchangers.

1942 By this time, IWT had already built more than 50 successful multi-bed ionXchangers (some of which are still in use today).

1943 IWT brought "automation" to ionXchange with the introduction of automatic ionXchangers, some of which were very large. (Some of *these* are still operating today, also.)

1947 This was the year when IWT brought out the first large (400 gpm) ionXchanger for silica removal.

1949 IWT built the first commercial *Mixed Bed* ionXchanger.
(U.S. Patents 2605084 2771424)

1954 A huge 5,000 gpm fully-automatic mixed-bed ionXchanger was designed and built by IWT to remove silica from make-up water for high-pressure boilers. This plant has now de-ionized over SIXTY BILLION pounds of water.

1957 IWT introduced "Counterflow," the first really new idea in multi-bed ionXchangers since the introduction of silica-removal techniques. (Patent pending.)

THIS EXPERIENCE CAN MEAN A LOT TO YOU

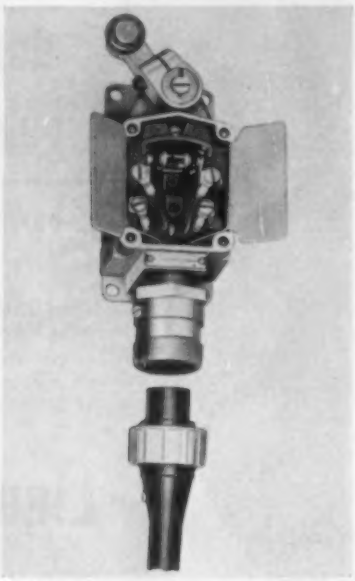
These ideas, and other IWT developments, can mean reduced costs, improved operations, and greater efficiency in your plant. *Check with your IWT representative.*

ILLINOIS WATER TREATMENT CO.
840 CEDAR ST., ROCKFORD, ILLINOIS
NEW YORK OFFICE: 141 E. 44th St., New York 17, N.Y.
CANADIAN DIST.: Pumps & Softeners, Ltd., London, Ont.

New Product Briefs (Continued)

Replaceable Limit Switch

K-14 A heavy-duty oil-tight limit switch which can be replaced without disturbing wiring is now offered by the **Square D Company**, 4041 N. Richards St., Milwaukee 12, Wis. The new design features a "power plug" which connects the power cable to the switch with a threaded coupling.

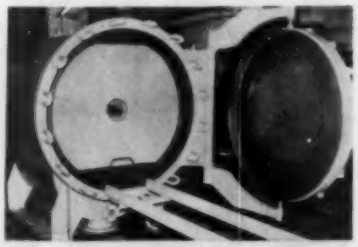


To replace a switch mechanism, just remove the four mounting screws, disconnect the power cable, and lift off the switch. A new factory-wired switch can then be mounted and the power cable reconnected. No wiring of any kind is necessary.

Filter for Utility Condensate Treatment

K-15 A filter specially designed for condensate scavenging applications has been developed by **Graver Water Conditioning Co.**, 216 W. 14th St., New York 11, N. Y. in cooperation with Davis Filtration Equipment Co., New York. It is being offered exclusively by Graver for use in the utility field.

The unit, known as the Graver-Davis Condensate Filter, is of the leaf type, with all-welded stainless steel leaves, stainless steel fittings and a silica-free celluosic material as the precoat. It cleans itself automatically with a centrally-located jet spray and has a quick-opening door giving easy access to the leaves. The leaves are nested on a portable cart which can be withdrawn from the filter shell in one minute for periodic inspection of the leaves.



Operating costs for the filter are negligible since the cost for replacement of precoat after cleaning comes to a few hundred dollars per year per unit. This is a significant factor, especially when contrasted with the replaceable cartridge type filter which requires a much higher operating cost.

Suspended matter down to 1/10 micron in particle size can be removed from condensate by the filter, assuring that such impurities will not exceed the parts per billion level set for scavenging practice.

Spray Atomizing Deaerator

K-16 **Cleaver - Brooks Special Products**, Waukesha, Wis., has introduced a new spray atomizing deaerator for marine applications, which provides positive removal of dissolved gases in boiler feedwater, preventing corrosion and assuring long boiler life.

Available in standard sizes with capacities from 15,000 to 1,000,000 pounds of water per hour, the deaerator reduces oxygen content of effluent to less than 0.005 cc per liter.

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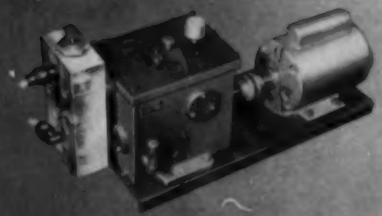

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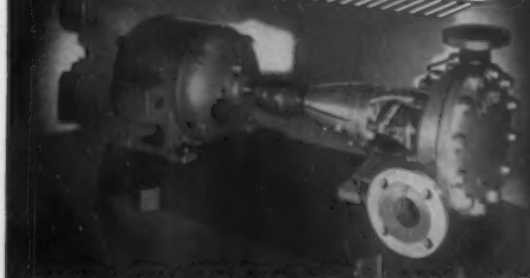

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5—Metal Cutters — Bulletin 655 shows actual cost figures on various metal cutting jobs (bolt, rod, wire, chain, etc.), by using hand and power-operated cutters. — H. K. PORTER INC.

17—Mechanical Packings — 32 p Cat. PC-103 describes a variety of packings & gaskets, including self-lubricating, sheet and molded packings, etc. Includes application charts and price information. — GREENE, TWEED & CO.

22—Lubricator Alert — Data sheet describes lubricator flow switch that indicates positive flow at terminal points on any force feed lubricator system. Easily installed on any existing application. Indicates lack of flow to the point of injection. — MANZEL.

29—Belting Repairs — Two bulletins "How to Properly Join Belts" and "Belt Fastener Selection Chart" offer service help on conveyor, elevator and transmission belting. — CRESCENT BELT FASTENER CO.

33—Air Compressor Rod Packing — Catalog 56 shows how "Compressor" No. 760 stays flexible under intense dry heat and protects rods from premature wear. — THE BELMONT PACKING & RUBBER CO.

45—Correct Lubrication — "Lubriplate Data Book" shows importance of providing and maintaining proper and economical maintenance of all types of plant machinery through adequate lubrication. — FISKE BROTHERS REFINING CO.

53—Steam Line Treatment — Folder describes alkaline IPCO S-L-T. Used in boiler water, it will volatilize and travel with steam to return lines. Prevents costly repairs and provides insurance against replacing pipe and fittings. — IPCO LABORATORIES, INC.

64—Anti-Corrosive Paints — Bulletin "The Application of Subox and Subalox Paints" — Gives the story of a complete paint system for weather, moisture and alkali protection, with details as to application.—SUBOX, INC.

70—Multi-Purpose Grease — Bulletins describe new single product Gulfcrown grease (4 consistencies) that does the work of many — simplifies application and avoids errors, reduces inventory and cuts lubrication costs; grease gun or centralized system application. — GULF OIL CORPORATION.

78—Control Heat & Glare — New folder tells how Sun-X Glass Tinting (transparent alkyd-based liquid plastic by duPont) is applied directly to existing glass by flow process without spray or splatter. Bonds tightly. Wash in usual manner. — AMERICAN GLASS TINTING CORP.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

122—Industrial Fans — Bulletin 702 covers Type XL fans for air and material handling. Volumes to 130,000 cfm pressures to 18" SP. Catalog 855 describes Pressure Fans. Volumes to 12,000 cfm, 10" to 50" SP. — CLARAGE FAN CO.

132—Glassed Centrifugal Pumps — 12 page Bulletin 725.2 describes line of glassed pumps for handling corrosive acids and alkalies. Every part of pump exposed to liquid has a tough glass surface. Specification, ratings, dimensions. — GOULDS PUMPS, INC.

135—Heat Exchanger — Bulletin 132 shows how sectional Aero unit gives close temperature control, saves labor, power, and water; design improves heat transfer to outdoor air by evaporation; 7,000,000 to 18,000,000 Btu/hr capacity range. —NIAGARA BLOWER COMPANY.

143—Chemical Feeders — 36 p Bul. 1136 describes metering pumps — types, construction, displacement and operating pressures. Gives handling recommendations for chemicals, acids, etc., and volumetric conversion tables. — MANZEL.

160—Boiler Feed Pumps—12 p Bulletin 122 describes and illustrates the type BFI high pressure pumps. Design features, service ratings and engineering data included.—PACIFIC PUMPS, INC.

189—Air Traps — Bulletin 289 describes ball float traps for draining water from air, gas or steam lines, or for draining light liquids from gas under pressure. Physical and selection data, prices, etc. — ARMSTRONG MACHINE WORKS.

INSTRUMENTS—METERS CONTROLS—REGULATORS

201—Valves & Gages — Handy guide No. 36 gives data & prices on valves, liquid-level gages & accessories for process and power industries. — PENBERTHY MFG. CO.

205—Draft Gages — Bulletins describe inclined, vertical tube, air filter gages, straight line and dial pointer type, minified draft and receiver type gages, velocity gages and pitot tubes, gas analyzers and steam calorimeters. — ELLISON DRAFT GAGE CO.

206—Process "Indicator" — Catl. 100 B shows how you can have maximum info on all process variables with Panalarm annunciators. Trouble

Bulletins (Cont.)

anywhere is signalled instantly — before it can grow big and expensive. — PANELLIT, INC.

209—Liquid Level Controls—Catalog describes controls for almost any liquid, at any pressure, at any temperature. Can be furnished in top-mounting, side-mounting styles, or as external float cage units. Almost unlimited application. — MAGNETROL, INC.

212—Automatic Temperature Control — Data sheets describe versatile automatic indicating temperature control, offering many sequence combinations—step-heating, heating and cooling, wide limit control, or temperature control plus operation of signal devices.—SARCO COMPANY, INC.

222—Pressure Regulators — Catalog No. 77 illustrates and describes application, operation and specifications for a complete line of reducing, back-pressure and pump-pressure regulators.—MASON-NEILAN.

223—Combustion Control — Bulletin 1023, 24 pages — Contains actual installation photos and diagrammatics of Bailey air operated combustion control for oil and gas fired boilers; two pages of chart records and six page list of typical installations. — BAILEY METER COMPANY.

228—Fuel Cut-Outs & Water Level Alarms — Brochure D2 — Electrode type equipment for installation on water columns to provide fuel cut-out, high and low water level alarms and pump cut on and off. For pressures to 2500 psi. — RELIANCE GAUGE COLUMN CO.

235—Liquid Levels — Bulletin 532 describes indicator which gives a reliable, automatic reading of storage tank contents. 20" dial in 3 x 10" case saves panel space. No outside power source needed; can be located up to 250 ft from tank. — THE LIQUIDOMETER CORP.

248—Pump Pressure Regulators — Bulletin 5306 describes constant and differential pump pressure regulators for steam turbines, reciprocating and motor driven pumps. Complete sizing and capacity information as well as construction features. — LESLIE CO.

259—Steam-Air Flow Meter — Product Specification M61-1 describes operation, construction and installation requirements of boiler meter used as a combustion guide for optimum firing of all types of fuels. — BAILEY METER CO.

281—Control Valve — 8 p Bul. J-170 describes sliding gate and plate control valves available. Includes engineering data, cutaway drawings, features, application information, dimensional drawings, flow capacities, rating charts, flow curve and sample specifications. — OPW-JORDAN.

287—Color-Port Water Gage — Bulletin WG-1814 describes the new gage for high pressure boilers (up to 3300 psi). Gives full details on design and operation and shows how it gives greater visibility and greatly reduced maintenance requirements. —YARNALL-WARING COMPANY.

PLANT CONSTRUCTION—WELDING EQUIPMENT—SPECIALTIES

300—Fact Folders — 23 up-to-date industrial fact-file folders on aluminum, steel, copper, stainless steel, insulation, roofing and other industrial supplies immediately available from 9 Southern warehouses. — REYNOLDS ALUMINUM SUPPLY CO.

301—Vacuum Cleaning Systems — How portable and stationary systems cut costs and increase plant efficiency shown in Booklet P8 and AB-100. Eight heavy duty units (1½ to 15 hp) for cleaning hard to get at areas, reclaiming valuable materials, etc. — U. S. HOFFMAN MACH. CORP.

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304—Backing Rings — Bulletin 56-2 describes rings designed for fast economical fit-up in piping, tubing, fittings and valves. Shows how rings assure uniform complete-penetration welds and ease of handling in both shop and field. Carbon steel, wrought iron, chrome alloys, stainless, aluminum and copper.—ROBVON BACKING RING COMPANY.

310—Incinerator — Metal cased, insulated, refractory lined incinerators for industrial and commercial use. City smoke code approved. Fast, economical installation — any size and capacity. — NORTH STATE PYROPHYLLITE CO.

315—Pressure Vessels — Catalog 100 discusses your plate fabrication problems and shows how company custom-fabricates hot water storage heaters, tanks, air receivers, blow-off tanks, etc. Corrosion resistant linings and materials featured. Suggested specifications and other valuable technical data given. — J. J. FINNIGAN CO.

317—Drier Compressed Air — Bulletin 130 shows how Aero After Cooler cools compressed air or gas below temperature of surrounding atmosphere; no further condensation in your air lines. Installed outdoors. Saves cooling water. Gives better operation of air-operated tools, etc. —NIAGARA BLOWER COMPANY.

319—Portable Band Saw — Bulletin describes the Kalamobile, a portable metal-cutting band saw. Has rubber-tired 12" wheels and telescoping handles. Capacity 6" rounds - 10" flat. — Machine Tool Div., KALAMAZOO TANK AND SILO CO.

322—Heat Transfer Cements — Engineering Data Book 502 includes calculations, estimating and installation procedures on properties and uses of Thermon heat transfer cements. Contains complete list of Southern engineering representatives. — THERMON MANUFACTURING COMPANY.

323—Mercury Vapor Fixture — Industrial color corrected units described in Bulletin 401. "Stabilux Socket" secures bulb end of lamp, eliminating lamp rupture and breakage from vibration. — WIDE-LITE CORP.

326—Beam-Type Guardrail—Manual FB-3456 describes how Flex-Beam Guardrail protects danger spots along roads, highways, bridges, and in industrial plant locations. Installation photos, drawings, reference data, dimensions and physical properties. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

328—Wrought Iron O. D. Piping — 8 p bulletin highlights wrought iron's durability in large O. D. applications. Includes specific water and sewage service records, recent installations, and an account of the famous Virginia City pipe line. — A. M. BYERS CO.

330—Elevated Water Storage — 4-color catalog describes the Aquatore — a new elevated water tank design with capacities from 300,000 to 3,000,000 gallons. Many design advantages including no struts or tie-rods. — GRAVER TANK & MFG. CO.

334—Storage Racks — Bulletin 17SP shows how Rackmaster Fittings cut rack-building time as much as 60% by eliminating threading and welding. Pipe 100% salvageable. — THE HOLLAENDER MFG. CO.

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348—Building Drainage — 64 p bulletin describes the advantages of 4-D wrought iron for soil, waste, vent and downspout piping. Includes sections on corrosive conditions, comparative service, costs, Durham systems, and photographic surveys on vent corrosion. — A. M. BYERS CO.

355—Steam-Jet Cleaners — Bulletins JC-100 and SG-200 describe steam-jet cleaners. Series "R" Speedylectric generates steam to 250 psig and temperatures to 405 F. Larger cleaners available. — PANTEX MFG. CORP.

356—Lightweight Steel Sheet Piling — Catalog lists specifications and uses of lightweight steel sheet piling for protection of light-load excavations. — L. B. FOSTER CO.

363—Magnetic Separators — Catalog 910 covers wet concentration and magnetic recovery. Various types and sizes shown as well as typical installations and machines. — JEFFREY MFG. CO.

386—Rigid Frame Building — 8 page bulletin "Dixisteel Rigid Frame Buildings" — low cost, flexibility of design, durability, and minimum maintenance; also triangular or bow-string truss all-steel roof systems; fabricated for rapid erection. — ATLANTIC STEEL COMPANY.

PIPING—VALVES—FITTINGS STEAM SPECIALTIES—TRAPS

401—Steam Traps — Bulletin 775 gives price, dimension and capacity data on Open Float and Thermostatic Steam Traps for trouble-free heating service.—ARMSTRONG MACHINE WORKS.

402—Forged Steel Valves — General Purpose Valves, Supplement No. 1 to Catalog F-9, covers gate, globe and angle valves. ½" through 2" sizes, for 150-800 pound service. Featuring 13% chrome stainless steel trim with hard facings. — HENRY VOGT MACHINE CO.

403—Valve Operators—Folder shows how re-designed sprocket rim makes any valve readily accessible from the floor. Simplifies pipe layouts, prevents accidents, fits all valve wheels. — BABBITT STEAM SPECIALTY CO.

407—Piping Materials — Bulletin reports on intensive investigation into problem of main steam piping materials and gives data on stress rupture characteristics of Types 316 and 347 stainless steel piping adjacent to welded joints. — PITTSBURGH PIPING AND EQUIPMENT COMPANY.

409—Lubricated Plug Valves—Catalog PV-4 covers operational features. Quarter-turn to open or close; lubricant grooves provide positive seal when valve is closed; when open, seating surfaces not exposed. — THE WM. POWELL COMPANY.

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412—Power Piping — 8 p brochure describes latest computer methods of analyzing power piping designs. — THE M. W. KELLOGG CO.

438—Steam Traps — 8 p Bulletin T-1742(57) illustrates and describes high capacity impulse steam traps. Includes capacities, dimensions, weights, and prices. — YARNALL-WARING CO.

443—PVC Fittings & Flanges — Corrosion resistant polyvinyl chloride pipe fittings & flanges covered in 12 p catalog, featuring characteristics, advantages, limitations, operating pressures, temperatures, field tests, etc.—GRINNELL COMPANY, INC.

465—Water Hammer — Cause, effect and control covered in Bulletin 851. — THE WILLIAMS GAUGE CO., INC.

478—Trap Selection—Booklet "How to Select Steam Traps and Other Fluid Specialties" gives valuable tips on which of the four basic types of traps — inverted bucket, thermostatic, combination or float — to use for any installation.—V. D. ANDERSON CO.

479—Multiport Drainers — Publication 5201 containing 8 pages describes units for removing large quantities of condensate under vacuum or pressures, as from evaporators, heaters, separators, coils, or steam lines (up to 200 psi maximum). Lists discharge capacities, shows features and typical installations. — COCHRANE CORPORATION.

BOILERS—STOKERS TURBINES—BURNERS

501—Package Boiler—New compact, low cost package unit (oil or gas fired) for small space requirements is described in Bulletin DK-1. Pressures to 325 psi, steam capacities to 45,000 lb/hr. — E. KEELER CO.

504—Steam Generators — Bulletin AXY-1 describes auxiliary equipment and design features of the Amesteam Generator for sizes 10 through 600 hp and illustrates how this integrated design reduces cost and increases life and reliability. — AMES IRON WORKS, INC.

505—Refractories — Paco High Heat Duty and Super Duty Plastic Refractories. Fire brick, high temperature cement, castables. Installation and engineering service. Free estimates and inspection. — NORTH STATE PYROPHYLLITE CO.

506—Package Boilers — Practical construction with Continental two pass design described in Bulletin BE100. Units range in size from 20 to 600 hp; 15 to 250 pressures burning oil, gas or combination. — BOILER ENGINEERING & SUPPLY.

513—Power Plant Equipment — 12 page booklet No. 1022-B gives details on combustion and boiler feedwater control, pressure reducing, desuperheating and automatic soot blowing — retractable and rotary. — COPES-VULCAN DIV.

521—Gas Tempering — How you can burn the most economical fuel available (coal, oil or gas) described in Bul. G-96. Cuts overall plant costs since smaller size unit requires smaller building per kw, etc. — THE BABCOCK & WILCOX CO.

531—Fuel Oil Treatment — Data sheet describes how Mogul treatment disintegrates, dissolves and disperses sludge in fuel oil storage tanks and equipment. Through sludge dispersal, maximum vaporization and combustion are possible. — THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

539—Industrial Burners — How to keep heating costs low with Hev-E-Oil commercial-industrial burners described in literature SPI-859. Models from 5 to 150 gph; automatic, electronic controls; Hev-E-Duty power gas burners and combination gas/oil burners from 720,000 to 21,000,000 Btu. — INDUSTRIAL COMBUSTION, INC.

542—Underfeed Stoker — Illustrated Cat. 401 gives complete data on double retort underfeed stoker built for heavy duty service in intermediate size range for boilers of 20,000 lb to 34,000 lb of steam/hr capacity. — DETROIT STOKER CO.

547—Gas and/or Oil Burners — Bulletin B1 describes large or small, single or dual fuel, packaged or field assembled, atmospheric or forced draft; electronics of all types; competent sales and service.—WEBSTER ENGINEERING CO.

Bulletins (Cont.)

551—Packaged Water Tube Boilers — Complete data and dimensions for boilers ranging from 8,000 to 50,000 lb/hr, firing oil or gas or both, described in 12 p Catalog 111-D. — SUPERIOR COMBUSTION INDUSTRIES, INC.

557—Coal — Current brochure on "Prescription Coals." — A. T. MASSEY COAL CO., INC.

561—Ash Removal — Bulletins S-57 & S-57A show how costs can be reduced with pneumatic and hydraulic ash conveyors. High operating efficiency based on tons of ash handled per pound of steam used. — NATIONAL CONVEYORS CO., INC.

574—Packaged Generator — Bulletin 582 describes Vapormatic Coil-N-Shell Steam Generator for service requirements of 5 to 150 psig. Gives operation features and specification data. Available with gas, oil, and combination gas/oil fuel systems. — TEXSTEAM CORP.

ENGINES—DRIVES POWER TRANSMISSION MATERIAL HANDLING

601—Crane Runway Rails — Catalog gives information on crane rails, angle bars, crane stops, rail clips, hook and anchor bolts, bearing plates. Also specifications on various sizes of crane rail clips and explains how to order rails. — L. B. FOSTER CO.

602—Pneumatic Ash Conveyors — Bulletin S57-A describes pneumatic ash conveyors for rugged, wear-resistant pipe and fittings that provide lower maintenance cost per ton of ash covered. — NATIONAL CONVEYORS CO. INC.

610—Flexible Couplings — All metal couplings described in Catalog 51A have no wearing parts; offer freedom from backlash, torsional rigidity; free end float; smooth continuous drive; and visual inspection in operation. — THOMAS FLEXIBLE COUPLING CO.

614—Vertical Transportation — Elevator Catalog — Describes and illustrates details of passenger and freight elevators, escalators, dumbwaiters, and modernization and maintenance equipment for use in industrial, utility and service plants. — OTIS ELEVATOR CO.

618—Casters & Wheels — Featuring "Lockweld" steel casters without a king-pin, Cat. C-57 describes full line of industrial wheels manufactured and distributed from Rome, Ga. plant. — THE FAIRBANKS CO.

630—Mechanical Vibrating Conveyors — Catalog 890 gives information on conveyability and density of typical solid materials and provides data on how to "Do It Yourself" to get required length. — JEFFREY MFG. CO.

634—Gear Requirements — 8p catalog describes equipment and facilities available to meet your most exacting gear requirements. South's leading gear, gear products, and power transmission equipment manufacturer. — VIRGINIA GEAR & MACHINE CORP.

704—Water Conditioning—Brochure describes company's engineering services — zeolite water softeners, filters and purifiers, modernized and rebuilt water softeners, aerators and degasitors and process and boiler water conditioning. — SOUTHERN WATER CONDITIONING, INC.

708—Zeolite Softener — 8 p Bulletin 4530-A discusses the hydrogen zeolite process — its advantages, chemistry and neutralizing variations. — COCHRANE CORP.

710—Scale Remover—Bulletin shows how Anco Scale Remover quickly eliminates scale in boilers, water lines, refrigeration and air conditioning systems — ANDERSON CHEMICAL COMPANY.

715—Amine Treatment—Return line corrosion is a critical problem in maintaining economical, efficient power plant operation. Bulletin CP-100 shows how amine treatment is an easy, effective and economical way to eliminate pipe corrosion problems. — THE BIRD ARCHER COMPANY.

716—Dust Collection — Whether nuisance elimination or process material recovery, check on Whirlex Dust Collector Units. Engineering data available. — THE FLY ASH ARRESTOR CORP.

723—Fly Ash Collection — Catalog 103 tells you how "Double Eddy" goes to work to increase boiler fly ash collection. Buell Cyclones will not clog or plug even with loadings up to one pound of ash per cu ft of gas.—BUELL ENGINEERING COMPANY, INC.

742—Water Treating Equipment Guide — Bulletin 615 illustrates and describes the newest in manual and automatic zeolite water softeners, demineralizers & deionizers, dealkalizers, etc. Spray and tray type deaerating heaters and water treating chemicals also included. — ELGIN SOFTENER CORP.

748—Stop Fungal Decay — Bulletin MT-58 describes company's preservative wood treatment for cooling towers, pinpoints organisms that destroy effective performance and prescribes treatment that arrests these destructive organisms, as well as the application techniques.—THE MARLEY COMPANY.

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771—Water Treatment — 4 p brochure points out company's 8-point water treatment coverage for elimination of scale, sludge, corrosion and impure steam. — IPCO LABORATORIES, INC.

774—Refrigerating Units — Bulletin 97-F illustrates and describes low-pressure refrigerating units. — FRICK CO.

ELECTRICAL

801—Motors—Bulletin describes and illustrates more popular a-c motors from 1 to 600 hp, for every process and manufacturing requirement. Single phase and polyphase; surpass NEMA specifications. — BROOK MOTOR COMPANY.

802—Small Relays—Simple solenoid design with only one moving part described in Bulletin 700. Silver alloy contacts need no cleaning, filing, or other maintenance. — ALLEN-BRADLEY CO.

813—600-Volt Wiring — How Anaconda Densheath 900 offers long life, high heat and moisture resistance, chemical stability and easy installation is described in Bulletin DM-5612 — ANACONDA WIRE & CABLE CORP.

820—Electrical Maintenance — New contract service (for Southeast only) inspects and tests motors, generators, gearing, control & distribution systems, etc., at a cost less than 1% of value of equipment. — Atlanta office of WESTINGHOUSE ELECTRIC.

874—High Voltage Rubber Cables — 32 p catalog contains information on design features, insulations available, and performance highlights of company's butyl rubber power cable, Durasheath. Also data on kinds of available constructions from 600 v to 15,000 v conductors. — ANACONDA WIRE & CABLE CO.

Late Bulletins

Y-1—Drive Units — Booklet, "Automator Variable Speed Drive," describes individually engineered drive units with one basic arrangement forming the foundation for the entire line. Gives examples of installations currently in use in industrial plants. — MARATHON ELECTRIC MANUFACTURING CORP., Wausau, Wis.

Y-2—Industrial Fans — Bulletin L-5, 28 pages, gives fundamental data relating to capacities and construction of the company's line of industrial fans. Explanatory tables and diagrams, and a list of accessories are included.—LEHIGH FAN & BLOWER DIVISION OF FULLER CO., Catasauqua, Pa.

Y-3—Turbine Pump Motors — Bulletin No. F-1975 — Full-color brochure features cross-section of the Unibase vertical pump motor, designed for short-coupled industrial pumping service. Describes construction and application.—U. S. ELECTRICAL MOTORS INC., P. O. Box 2058 Terminal Annex, Los Angeles 54, Calif.

Y-4—Electronic Control — Bulletin A-913, 8 pages, contains a large illustrated chart on which all major system components are arranged functionally to enable reader to see quickly what control instrumentation is available for a given process variable. Defines overall scope of application. — SWARTWOUT CO., 18511 Euclid Ave., Cleveland 12, Ohio.

Y-5—Mechanical Drives — Bulletin 3600, 6 pages, illustrates and describes the Allispede mechanical adjustable speed drive, which operates on a-c power, offers speed ranges up to 8:1, and is available in ratings from 1 to 30 hp. — THE LOUIS ALLIS CO., 427 E. Stewart St., Milwaukee 1, Wis.

Y-6—Tubing — Folder TB-430, 4 pages, "How to Cut Cost by Using Alloy Mechanical Tubing," discusses initial cost, structural advantages of tubing, fabrication by machining, types of steel, types of tubes, and procurement tips. — TUBULAR PRODUCTS DIVISION OF THE BABCOCK & WILCOX COMPANY, Beaver Falls, Pa.

Y-7—Flexible Couplings — Bulletin A669C, 12 pages, describes an expanded line of flexible cushion couplings ranging from fractional to 190 hp per 100 rpm. Tables of horsepower ratings, prices, dimensions, and service factors for many applications are included. — DODGE MANUFACTURING CORP., Mishawaka, Indiana.

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4. By-pass re-entry opening.
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6. Cleaned gas outlet.

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Ordinary cyclones provide limited efficiency in collecting boiler fly ash, because of "double eddy" currents inside all cyclones. But Buell Cyclones make the Double Eddy work to increase efficiency—The Double Eddy circulates vertically inside all cyclones acting against the normal separating force of the spinning stream of gas and ash. Buell Cyclones have a narrow "Shave-off" port (2) at the top of the casing. This port catches and removes ash trapped in the Double Eddy. It makes the cyclone more efficient instead of less.—Only Buell Cyclones have the Shave-off. And only Buell Cyclones combine this efficiency with large diameter: they will not clog or plug even with loadings up to one pound of ash per cubic foot of gas. No field fitting is needed: they are completely assembled and match-marked before shipment. They can be completely lined, inside and out, against heat, corrosion and abrasion.—For a list of installations near you, a copy of our Catalog 103, or other information, call our nearest representative, listed in the telephone classified directories of most major cities under "Dust Collection Systems". Or write Dept. 80-K, Buell Engineering Company, Inc., 123 William Street, New York 38, New York. (European Subsidiary: Ambuco Limited, London, England.)

EXPERTS AT DELIVERING EXTRA EFFICIENCY IN DUST RECOVERY SYSTEMS: CYCLONES—"SF" ELECTRIC PRECIPITATORS—COMBINATION SYSTEMS—DRY CLASSIFICATION SYSTEMS.

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EXTRA
ADVANTAGES
of **PENBERTHY**
LIQUID LEVEL GAGES

- **STRENGTH** — for pressures to 10,000 psi and higher.
- **ACCURACY** — clear, accurate liquid-level readings on tanks, boilers, vessels, flow lines, etc.
- **MAINTENANCE** — exclusive "raised glass" design assures perfect frame, glass, and gasket alignment. Makes cleaning and replacement economical and easy.
- **TEMPERATURE RANGE** — from sub-zero to over 750°F.
- **CUSTOM DESIGNS** — in bronze, iron, carbon steel, stainless steel, monel, other alloys as required for corrosive protection or other specific requirements.
- **AVAILABILITY** — Standard designs stocked by oil field supply stores, and mill supply houses. Special gages to order from our factory.

WRITE for your copy of our Catalog #36.

PENBERTHY

PENBERTHY
MANUFACTURING COMPANY
Division of Buffalo-Eclipse Corporation
Dept. SPI, Prophetstown, Illinois

Bulletins (Cont.)

Y-8—Maintenance Equipment — Catalog P-9, 24 pages, contains information on pulling systems, rams, pumps, hydraulic shop presses, and heavy duty wrenches for industrial maintenance. Illustrated. — OWATONNA TOOL COMPANY, 395 Cedar St., Owatonna, Minn.

Y-9—Outdoor Pump Motors — Bulletin No. 1953 describes and illustrates the Holloshaft turbine pump motors for outdoor service, and explains principles of design including relationship between form and function. — U. S. ELECTRICAL MOTORS INC., P. O. Box 2058 Terminal Annex, Los Angeles 54, Calif.

Y-10—Proportioning Pump — Bulletin No. 1107.20-1, 2 pages, describes a plunger - type, small capacity proportioning pump designed for the accurate and efficient treating of small, low pressure boilers.—B-I-F INDUSTRIES, INC., 345 Harris Ave., Providence, R. I.

Y-11—Refrigerated Purging — Bulletin No. 700, 12 pages, presents data on the automatic removal of air from refrigeration systems; tells why purging is necessary, how non-condensible gases affect efficiency; describes application of refrigerated purger. — ARMSTRONG MACHINE WORKS, Three Rivers, Mich.

Y-12—Air Conditioning — Bulletin 596, 4 pages, discusses "Control of Water Problems in Air Conditioning Systems." Covers scale formation, corrosion, slime and algae growths, and offers suggestions for control through planned chemical treatment. — BETZ LABORATORIES, Inc., Gillingham & Worth Sts., Philadelphia 24, Pa.

Y-13—Electromagnetic Clutches — Bulletin R-6304-1B, 20 pages, furnishes detailed information on complete line of electromagnetic clutches with torque capacities from 1.8 through 13,000 pound-feet. Design, specification, and application material includes photographs, drawings and diagrams. — I-T-E CIRCUIT BREAKER COMPANY, 1900 Hamilton St., Philadelphia 30, Pa.

Y-14—Speed Reducers — Booklets J-18 and J-19, 24 pages each, contain engineering data on shaft-mounted, in-line helical and right-angle helical speed reducers. Rating tables and selection procedures are included for engineers specifying power transmission machinery. — HEWITT-ROBINS INCORPORATED, 666 Glenbrook Road, Stamford, Conn.

Y-15—Self-Lubricating Packings — Catalog SLP-659, 12 pages, tells what Palmetto self-lubricating packings are and describes their advantages and applications on pump rods and shafts and valve stems. Each of the 29 types is illustrated, and price list is included.—GREENE, TWEED & COMPANY, North Wales, Pa.

Y-16—Transformers — Catalog 5A3-BL01, 6 pages, describes redesigned line of Boost and Buck transformers featuring wiring compartment connection taps to provide increasing line voltage 6.66, 10, 13.32, 20 or 26.64%; or reducing line voltage 4.75, 6.25, 9.1, 10 or 11.8%. Includes connection diagrams. — ACME ELECTRIC CORPORATION, Cuba, N. Y.

STATEMENT

of the ownership, management and circulation required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code Section 233) of SOUTHERN POWER AND INDUSTRY published monthly at Charlotte, N. C., for October 1, 1959.

1. The names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, W. R. C. Smith Publishing Company, Atlanta 8, Georgia; Editor, Francis C. Smith, Atlanta 8, Georgia; Managing Editor, Richard L. Priess, Atlanta 8, Georgia; Business Manager, Eugene W. O'Brien, Atlanta 8, Georgia.

2. The owners are W. R. C. Smith Publishing Co.; Estate of W. R. C. Smith, Atlanta, Ga.; O. A. Sharpless, Atlanta, Ga.; J. C. Cook, Atlanta, Ga.; W. J. Rooke, Atlanta, Ga.; T. W. McAllister, Windemere, Fla.; E. W. O'Brien, Atlanta, Ga.; Seba J. Jones, Atlanta, Ga.; Mrs. E. L. Philpot, Atlanta, Ga.; Richard P. Smith, Atlanta, Ga.; A. F. Roberts, Atlanta, Ga.; W. C. Herbert, Atlanta, Ga.

3. The known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or any other security holders are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

E. W. O'BRIEN, Managing Director.

Sworn to and subscribed before me this 23rd day of September, 1959.

SEBA J. JONES, Notary Public.

My commission expires Feb. 28, 1962.

(*Continued from Page 20*)

A. M. Byers—Virginia

William V. Wilkinson, Richmond, Va., has been assigned field service engineer for the State of Virginia by **A. M. Byers Company.** Mr. Wilkinson replaces Douglas F. Williams

who has been promoted and reassigned in the firm's sales organization.

Before joining Byers, Mr. Wilkinson was associated with the Cardox Division of Chemetron Corporation as a district manager. His office is located at 1-D East Grace Street, Richmond.

Bailey Meter Co. Corpus Christi, Texas

Bailey Meter Company announces the appointment of **K. R. Dodson** as resident engineer in Corpus Christi, Tex., subdivision of the company's

Houston district. Dodson's address is 1009 Belmeade, Corpus Christi, Texas.

Mr. Dodson joined the company in 1952, and has been on the Houston staff since that time. He is a graduate of the U. S. Merchant Marine Academy with a major in marine engineering.

Why IPCO PRODUCTS Feedwater Treatment?

Because of their progress in the practical solution of feedwater problems peculiar to the Southeast.

Ipco Laboratories, Inc., preventative maintenance program guarantees to keep your boiler, steam and return lines free from damaging scale, rust and corrosion.

With new equipment costs at an all time high it is more necessary than ever to properly maintain your boiler equipment to assure peak efficiency, longer life.

Whether yours is a new installation or one that is now operating, IPCO Laboratories preventive maintenance program can save you money. Write today.

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Babbitt

Adjustable

SPROCKET RIM

with Chain Guide

Changes that Danger Zone to a

SAFETY ZONE

The distance between the floor of your plant and your overhead valves is a DANGER ZONE when piled up boxes or even ladders are used to reach the valves.

Turn it into a SAFETY ZONE — equip your overhead valves with Babbitt Adjustable Sprocket Rims with Chain Guides.

- They simplify pipe layout.
- They fit any size valve wheel.
- They are easy to install and operate.
- They operate any valve from the floor.
- They save time and money.
- The first cost is the only cost (no maintenance).
- They are packed completely assembled (one to a carton), with easy-to-follow instructions.
- A hot-galvanized rust proof chain is available for all sizes.

Babbitt Adjustable Sprocket Rims with Chain Guide are carried in stock by most mill supply houses. If your supplier does not carry them, contact us direct.

Babbitt

168-9

STEAM SPECIALTY CO.

3 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

Florida Member Heads NISA Convention

Michael E. Assalone, manager and treasurer of Florida Electric Motor Co., Miami, has accepted the general chairmanship of the 27th Annual Convention of the **National Industrial Service Association.** Mr. Assalone, who has appeared as a speaker and panel participant at many NISA national and regional meetings in

the United States and Canada, will be responsible for the planning of the meeting which will be held May 4-7, 1960, in Miami Beach, Florida, at the Hotel Fontainebleau.

Assisting Mr. Assalone will be **Lewis S. Bain,** owner, Jack's Electric Motor Repair, Inc., Fort Lauderdale, Florida, entertainment chairman; **Joe M. Wright,** Turner Electric Works, Jacksonville, Florida, program chairman; **Richard F. Taylor,** A&F Electric Motor Repair, Miami, Florida, information chairman; **William C. King,** owner, King Electric Motor Service, Miami, Florida, transportation chairman; **Ralph Swartz,** vice president and general manager, Peninsular Armature Works, Miami, Florida, exhibits chairman.

BS&B—Carolinas

The Hawkins Company, 201 Builders Building, Charlotte 1, North Carolina, has been appointed manufacturer's representative for **Black, Sivalls & Bryson, Inc.** controls, safety head and tank vents in North and South Carolina.

Furnas Electric Co. Carolina Representative

Robert W. Chapman, 958 Bromley Road, Charlotte, North Carolina has been appointed Sales Representative for the **Furnas Electric Company.** Mr. Chapman will represent the entire Furnas line of electric motor controls in both North and South Carolina.

Prior to his present position he was Regional Sales Manager for the A. O. Smith Corporation, Electric Motor Division, and before that he was Product Manager for the Reliance Electric and Engineering Company. Mr. Chapman has a Bachelors Degree in Electrical Engineering from Duke University. He is a native of Charlotte.

U. S. Rubber — La.

John M. McCarthy has been named district sales manager for mechanical goods at the **New Orleans** branch of the **United States Rubber Co.,** 900 South Jefferson Davis Parkway. He replaces Delwood C. Lee, who had held that post the last five years.

Technical Director Lynchburg Foundry

Harvey E. Henderson is now technical director of **Lynchburg Foundry Company,** Lynchburg, Virginia. An employee of Lynchburg Foundry

Company since 1947, Mr. Henderson served as a metallurgist in various capacities and, most recently, has been project engineer in the company's research department. He holds B.S. and M.S. degrees in chemical engineering from Virginia Polytechnic Institute.

Dravo — Southeast

Charles F. Wheelock & Associates, 205 South Thirty-second Street, **Birmingham 1, Alabama,** manufacturers representative, has been appointed distributor of Dravo Corporation's heating equipment for a territory that includes most of Alabama and Mississippi and 10 counties in northwestern Florida.

Cooling Tower Institute Headquarters at Houston

The **Cooling Tower Institute** has transferred its offices from Palo Alto, California, to 1120 W. 43rd St., Houston 18, Texas. Operation of the CTI programs continues in the broad areas of research and in the publication of industry standards under the direction of James L. Willa, manager.

Mr. Willa is taking over the administrative operation of this association of major manufacturers of industrial water-cooling towers after 8 years in the capacity of field engineer for the national group.

In addition to industry standards on acceptance test procedure, redwood lumber specifications and design data, nomenclature and wood maintenance, CTI has recently published new standards on Douglas fir lumber specifications and design data, pressure preservative treatment of cooling tower lumber, recirculation and application of recirculation factors, gear speed reducers, all of which are available from CTI at nominal cost.

LeTourneau — Texas

In a move to further diversify an extensive product line, **R. G. LeTourneau, Inc., Longview, Texas,** is offering its Steel Division products to the open market. **James R. Anderson** has been employed to assist in handling the needs of steel sales customers. He has just completed six years with the Earl M. Jorgensen Steel Co. of Dallas.

The move by LeTourneau will make available to Southern industry an additional supply of high quality steel plate, which frequently is in short supply due to peak demands in other geographic areas.

It costs you money when you run out of steel bars and shapes at a critical time! On the other hand, large steel inventories tie up capital and space. Avoid both pitfalls. Order DIXISTEEL rolled products from your nearby Steel Service Center. You can count on fast, dependable delivery of hot rolled bars and shapes in a wide variety of sizes—and always of the same high-quality.

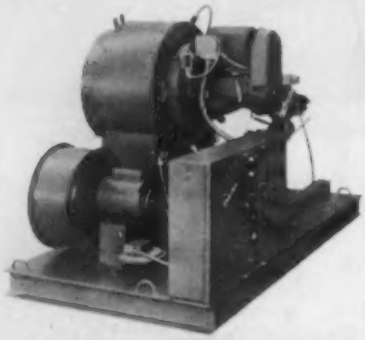
Write, wire or phone for the name of the Steel Service Center nearest you.

Atlantic Steel Company

P. O. Box 1714 • Atlanta 1, Georgia • TRinity 5-3441

Webster

GAS and/or OIL BURNERS



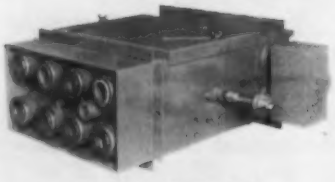
LARGE or SMALL

SINGLE or DUAL FUEL

PACKAGED or FIELD ASSEMBLED

ATMOSPHERIC or FORCED DRAFT

ELECTRONICS of ALL TYPES



COMPETENT
Sales and Service
in all areas

Write for Bulletin B1

The
WEBSTER ENGINEERING
Company
Box 5246, Tulsa, Oklahoma

I-T-E — Southern District Offices

Two new southern district sales offices — one in Memphis, the other in New Orleans — have been opened by **I-T-E Circuit Breaker Company**, Philadelphia, Pa.

Wm. L. Anderson

William L. Anderson has been appointed district manager of the new Memphis office located at 219 Adams Ave. Anderson was formerly a field application engineer in I-T-E's Pittsburgh district office for eight years.

Joseph T. Bauer

Joseph T. Bauer was appointed district manager of the New Orleans office located at 1500 Carondelet St. He was previously a field application engineer in the company's Kansas City district office for three years.

Rockwell—Shreveport

Harold O. Proske, Director of Sales Aids and Training, has been named branch manager, Shreveport, Louisiana, office of Rockwell Manufacturing Company's Meter and Valve Division.

A native of St. Louis, Mo., Mr. Proske studied mechanical engineering at Washington University.

Faultless Caster Corp., S.E.

To give better service to distributors and manufacturers in the Southeast, a new warehouse has been opened by **Faultless Caster Corporation** at 2245 South Augusta Street, **Greenville, S. C.** It is under the supervision of **George T. McLeod**, Faultless district sales representative for the Greenville territory.

Husky Products, Inc. 14 New Agents

Husky Products, Inc. Cincinnati, Ohio, has appointed the following representatives for its cable support systems: Alabama — Chas. W. Ashby Co., Birmingham; Florida — Geo. Weeks & Assoc., Jacksonville; Georgia — Osgood & Assoc., Inc., Atlanta; Indiana, Kentucky (West) — Engineering Products, Indianapolis; New Mexico — Marshall R. Elmore & Co., Carlsbad; North Carolina — E. T. Green, Greensboro; Ohio (South), Kentucky (East) — Phister Engineering Co., Cincinnati; Oklahoma — Nelson Elec. Supply Co., Tulsa; Pennsylvania (East), Delaware, Virginia, District of Columbia, Maryland, New Jersey — Rumsey Elec. Co., Philadelphia; Pennsylvania (West), West Virginia — Brown Electric Equipment Co., Pittsburgh; South Carolina — Engineer Sales Co., Columbia; Tennessee — Pitner's Mfg. Co., Knoxville; Texas (North) — Electrical Agencies of Dallas, Dallas; and Texas (South) — Electrical Agencies of Houston, Houston.

Husky specializes in the manufacture of complete cable support systems of aluminum or galvanized steel, for outdoor or indoor installation.

Hooker Chemical Corp. Tennessee Appointments

H. William Kopp, Jr. has been appointed works manager and **Theodore T. Garrett** named technical superintendent at the Columbia, Tenn., plant of the Phosphorus Division of Hooker Chemical Corporation.

In his new position, Mr. Garrett is responsible for quality control and process improvement, and also coordinates technical activities with division and corporate engineering offices.

Mr. Kopp had been works manager of the Phosphorus Division's sodium tripolyphosphate and phosphoric acid plant in Dallas, Texas, where he has been succeeded by John W. Bunch.

Melpar Engineer Honored

The National Bureau of Standards recently presented the Certificate of Award to Melpar Project Engineer, **Raymond Letner,** for the development of a new method for fabricating and welding thin walled cylinders. Melpar, Inc., at Falls Church, Va. is a subsidiary of Westinghouse Air Brake Co.

Air-Maze Corp.—Texas

The **Air-Maze Corporation** has appointed **The Eads Company,** headed by Ralph Eads, 1115 Dunlavy, Houston, as representatives in the State of Texas.

Ralph Eads

The Eads Company also has a Dallas office at 5523 Dyer St., with Jack Holland as manager. The new factory representatives will handle the industrial line of air and liquid filters, including filters for the gas transmission and petroleum processing industries.

American Viscose Virginia Promotions

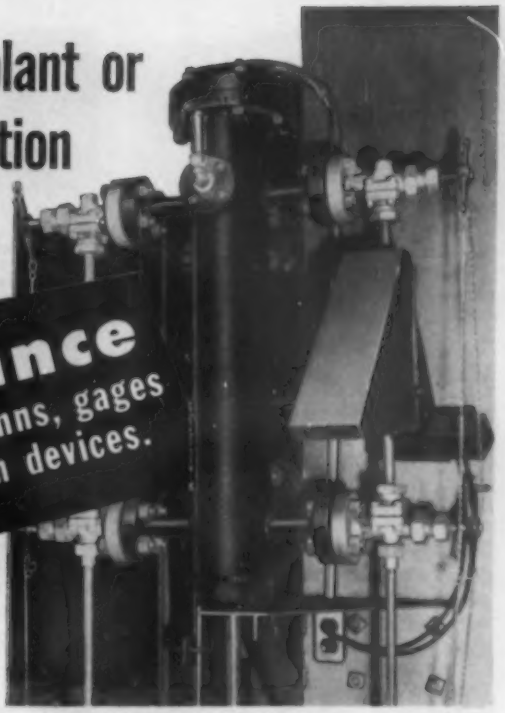
A recent merger of the Vicose Department and the Spinning Department under the supervision of **Uriah M. Brist** has been announced by American Viscose Corporation's Fredericksburg cellophane plant. **Harry J. Boyer,** former head of the Viscose Department has been promoted to the newly-created position of head of the Special Cellulose Products Department.

Mr. Brist joined the American Viscose Front Royal rayon plant in 1940. In 1952 he was transferred to Fredericksburg as head of the Spinning Department. Prior to joining American Viscose in 1935, Mr. Boyer was associated with the Filatex Corporation.

For new plant or modernization

...you'll be wise to select...

Reliance
water columns, gages and alarm devices.



Reliance Alarm Water Column, Twin Gages and Trim

Reliance EYE-HYE Remote Gage

Reliance LEVALARM Electrode-type control

Plan wisely for completely safe water level supervision on all boilers, and all water-containing vessels, with rugged, efficient Reliance equipment. This specialized line includes water columns for any type of boiler — any pressure — and complete trim, including various types of gage valves and inserts, direct-to-drum assemblies and illumination; remote reading gages, auxiliary alarms and automatic controls.

Two most valuable *additions* to your present equipment are the EYE-HYE — safe, sure *manometric* remote reading gage — and the several LEVALARMS which provide instant control of alarms, fuel cut-out and pump operation. If not acquainted with them, write for literature.

Known the world over for accuracy, sturdiness and dependability, Reliance equipment brings you the advantages of trouble-free low-maintenance service. For keeping your plant in the best of trim now, or for planning new or revised power facilities, keep posted on the latest in Reliance Boiler Safety Devices.

The Reliance Gauge Column Co.
5902 Carnegie Ave., Cleveland 3, Ohio

BOILER SAFETY DEVICES
Reliance

1884 75th YEAR 1959

Biennial Exposition Chemical Industries

More than 450 manufacturers have already engaged space for displays at the 27th Exposition of Chemical Industries, representing a large proportion of the entire area available on the four floors of the New York Coliseum, where the Exposition will be held November 30 to December 4.

Since 1915, this biennial exposition has provided a market place for the practical advancement of all the mechanical arts, since the penetration of chemistry is universal throughout industry. Displays include chemical processing equipment, chemical materials, and the metals, plastics and other substances employed in mechanical construction of every kind, as well as functional units and component parts.

Registered admissions totaled upwards of 40,000 at the last Exposition, two years ago. Admission is by invitation and registration only. The general public will not be admitted.

The management is staffed by the International Exposition Company.

One of the world's largest gas burners is being inspected by Victor DeGeer, Shop Superintendent of **The Webster Engineering Company** of Tulsa, Oklahoma. With a special venturi burner body of stainless steel, this one unit will smokelessly dispose of propane vapor at the rate of 386,000,000 Btu/hr in case of an emergency in a major gulf coast oil refinery. This is sufficient fuel to heat 5,000 homes.

PALMETTO. PACKINGS

Perfect Combination

PREMIUM QUALITY

COMPETITIVE PRICE

Now—it costs you no more for Palmetto Packings than others of lesser quality. Get the perfect combination of price and quality from your authorized Palmetto distributor. For the name of the supplier nearest you refer to our insert in Thomas' Register—"Packing Section".

Write us for descriptive literature.

GREENE, TWEED & CO.

NORTH WALES, PA.

General Electric — Louisville, Ky.

John F. Simons will become Manager—Relations and Utilities at **General Electric Company's** Appliance Park, Louisville, Kentucky, according to an announcement by Charles K. Rieger, Vice President and General Manager of the Company's Major Appliance Division.

Simons will assume responsibilities formerly held by **Lester H. H. Means**, whose appointment to the newly established position of Manager — Government Relations for General Electric's Major Appliance Division also was recently announced by Rieger. Means will continue to occupy offices at Appliance Park, and will establish additional offices for the newly established Government Relations functions at Washington, D. C.

As Manager—Relations and Utilities, Mr. Simons will be responsible for a wide variety of functions at Appliance Park, including local public and employee relations, and labor relations. His responsibilities also will include landlord, plant protection, utility, and plant engineering functions.

Simons presently is Manager—Employee and Community Relations for General Electric's X-Ray Department which operates plants in Milwaukee, Wisconsin and St. Petersburg, Florida.

In 1948 he joined the General Electric Company on the staff of L. R. Boulware — Vice President — Relations Service, in New York City.

In 1950 Mr. Simons was named Administrative Assistant to the President of Ebasco International Corporation and was given the assignment of setting up public and employee relations programs for the sixty-five power, light and utility companies that Ebasco operates throughout Latin America. A considerable portion of his time during this period was spent in Mexico and Central America.

Mr. Simons returned to the General Electric Company in 1952 and spent another two years in the New York office, again on the staff of L. R. Boulware. In 1954 he was appointed Manager of Employee and Community Relations for the Company's X-Ray Department.

Leece-Neville Company Gainesville, Ga., Plant

Production facilities for its newly acquired line of ac motors will be located in **Gainesville, Georgia**, it was announced by **Leece-Neville Company**, who recently purchased this line from the O. A. Sutton Company, Wichita, Kansas. Limited production from the Gainesville Division was scheduled for early fall. Ellis B. Gitchell has been named manager.

Flintkote Opens Baltimore Warehouse

The Flintkote Company has opened a large, new warehouse in Baltimore, Md.

Located at Hillen and High Streets, the warehouse is designed to house the company's extensive line of asphalt roofing products for more efficient and speedier distribution in the areas served by the Baltimore market.

Marketing Agreement for Vicksburg Plant Output

Southern Oxygen Company, Washington, D. C., has announced an exclusive sales and distribution agreement with **Spencer Chemical Company**, Kansas City, Missouri,

wherein Southern will market the entire liquid argon output of Spencer's Vicksburg, Mississippi plant.

Large bulk argon liquid storage stations are being installed at strategic points from which liquid argon deliveries can be made, and cylinders refilled for distributors and consumers.

KEEP-UP-TO-DATE
USE SPI
READER SERVICE

See Pages 65 & 66

Reynolds Arkansas Plant

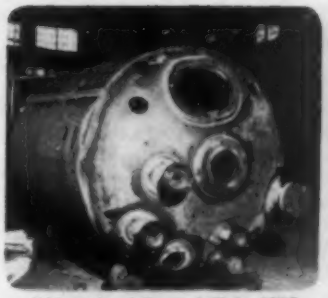
New equipment installed at **Reynolds Metals Company's** Hurricane Creek, Ark., plant will increase production capacity to over 20,000,000 pounds of hydrated alumina annually. Previously production was on a pilot plant scale.

Unique chemical properties of the hydrate made at this plant and the particle size of less than 1 micron make it useful in the manufacture of a wide line of chemicals, white rubber, plastics, catalysts, ceramic colors and many other products.

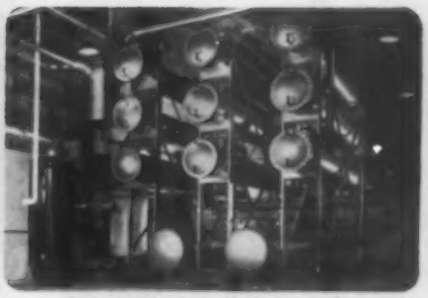
R. G. LeTourneau Honored

The military's Joint Chiefs of Staff selected **Robert G. LeTourneau** to receive the 1959 National Defense Transportation Association's Award scheduled for presentation Oct. 14. The award identifies the recipient as the person whose achievement contributed most to the effectiveness of the transportation industry in support of national security.

Mr. LeTourneau spent more than six years developing a revolutionary "electric wheel" system for powering ultra-heavy-duty equipment — ranging from gigantic rubber-tired trains for the Arctic to the world's largest road-building machines. He also designed the world's largest rubber tires (10 ft tall and 4 ft wide) which now are in wide use on equipment built by his firm, R. G. LeTourneau, Inc., of Longview, Texas.



Frick reactor shells are built by ASME qualified welders.



Condensers, Receivers, Oil Separators, Gas and Liquid Coolers, Accumulators, and Precoolers are furnished in all sizes.

for SHELL VESSELS

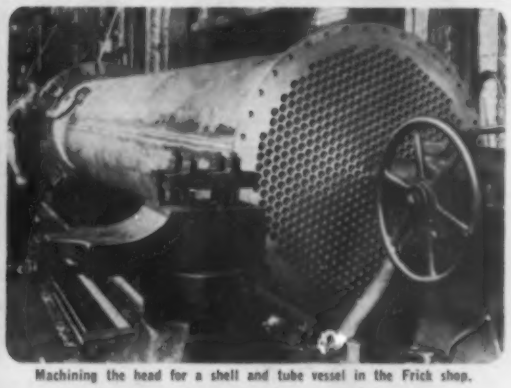
Look to TRADE FRICK MARK **Engineers**

With 106 years' experience in building pressure vessels, from boilers to reactors, we're able and ready to fill all your needs. We have the shears, planers, power rolls, automatic welders and mechanics to do this type of work.

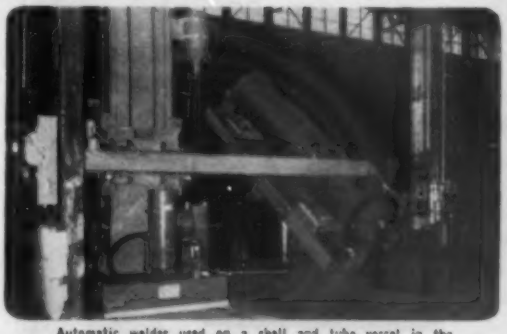
Write for recommendations and estimates on your shell vessel work to . . .

WAYNESBORO, PENNA., U.S.A.
FRICK CO.

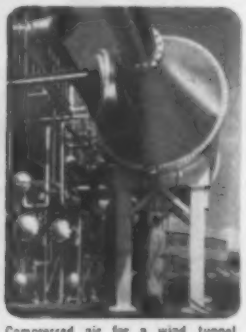
Frick vertical shell condensers.



Machining the head for a shell and tube vessel in the Frick shop.



Automatic welder used on a shell and tube vessel in the Frick shops at Waynesboro, Penna.



Compressed air for a wind tunnel conditioned with Frick equipment.

Oliver Dam Georgia Power Co.

Power is now flowing from Oliver Dam, the **Georgia Power Company's** new hydroelectric generating plant on the Chattahoochee River at Columbus.

The plant's initial power is being produced by an 18,000-kilowatt generator. When three additional generators are placed in service, Oliver Dam's total generating capacity will reach 60,000 kilowatts, making it one of the company's larger hydroelectric plants.

The 75-foot-high and 2,021-foot-long dam, with its powerhouse installation, is named for James M. Oliver, former executive vice president and general manager of the Georgia Power Company.

Johnston Brothers—Ga.

Johnston Brothers, Inc., announces the appointment of **C. D. Barclay,** 2110 Robin Hood Road, Albany, Georgia, as representative for the State of Georgia.

Epes-Fitzgerald Completes Expansion

Completion of a new 29,000 sq ft branch warehouse in Columbia, S. C., marks the final step of a half-million-dollar building and modernization program by **Epes-Fitzgerald Paper Company.**

Over a nine-year span the company has constructed a new headquarters building in Richmond and new branch warehouses in Norfolk, Va., and Raleigh, N. C.

Diamond Alkali — S.E. Dist.

Appointment of **Rex Williams, Jr.,** 1177 Dorothy Place, **Memphis, Tenn.,** as sales service representative for Diamond Alkali Company was announced by R. B. Perry, Manager of the Company's Southeastern District Sales Office.

Mr. Williams' territory includes the State of Alabama and the northwestern tip of Florida. He replaces **William N. Chastain** who moves on to **Charlotte, N. C.** as a Diamond salesman.

Daniel Opens Atlanta Office

A new office in Atlanta has been opened at 1401 Peachtree Street, N.E., as headquarters for **Daniel Construction Company of Georgia.**

Mr. James F. Daniel, III, is manager of the Atlanta office and Mr. Samuel Wilson is manager of sales.

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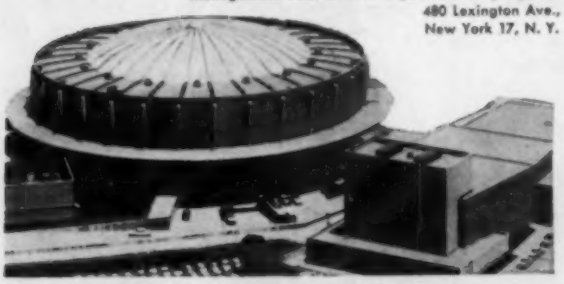

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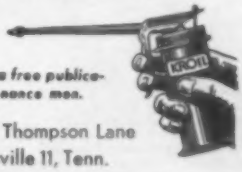

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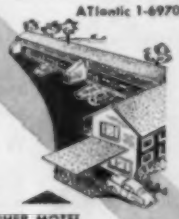

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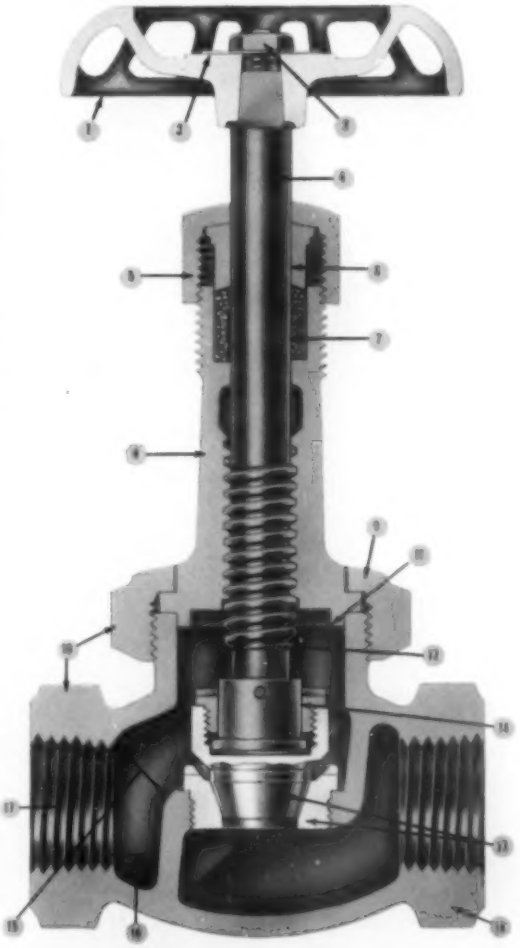

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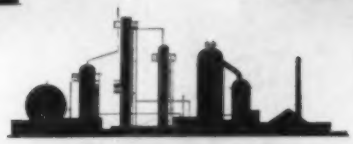

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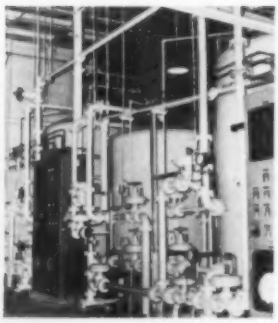

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